THE MAGAZINE FOR AUSTRALIAN RADIO AMATEURS

Amateur Radio

Volume 75
Number 12
December 2007

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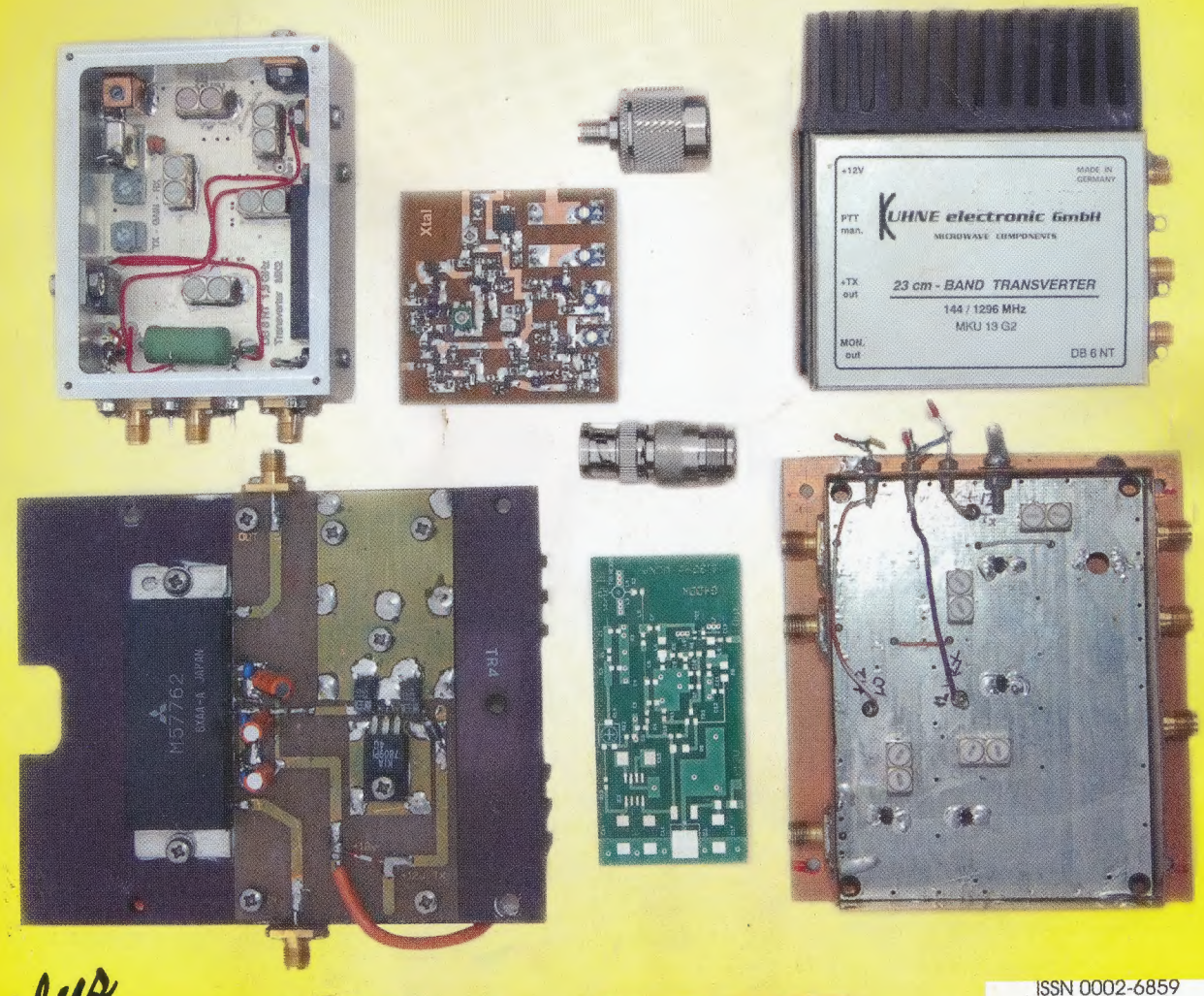

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Drew Diamond VK3XU

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Our Cover this month

The key components required for 23 cm, build your own or ready to go. Photo by Peter Freeman VK3KAI. See the article commencing on page 34.

Contributions to Amateur Radio
Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, 'How to write for Amateur Radio' is available from the National Office on receipt of a stamped self-addressed envelope.

Back Issues
Back issues are available directly from the WIA National Office (until stocks are exhausted), at $4.00 each (including postage within Australia) to members.

Photostat copies
When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

Disclaimer
The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for incorrect information published.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Editorial Comment

Peter Freeman VK3KAI

Season's Greetings

The members of the Publications Committee (PubCom) wish everyone a safe and happy festive season. The past year has been busy, yet it seems as if the last Christmas/New Year season was only a short time ago.

As we head toward the end of this year, many amateurs' minds turn to the performance of their station, especially those interested in VHF, UHF and microwave bands, as summer will hopefully bring with it enhanced propagation. Of course, do not forget the Ross Hull Memorial Contest, commencing Boxing Day and running for approximately three weeks, and the Summer VHF/UHF Field Day Contest on the last weekend of the Ross Hull.

Callbook 2009

"What is he doing?" I hear you say – "the 2009 Callbook? The 2008 volume has only just been published!" Well yes, but publications such as the Callbook take considerable planning.

PubCom would welcome constructive feedback on the 2008 Callbook, so that we can plan ahead for the 2009 volume. Design of the 2009 Callbook will start in March, so we need your comments soon. We are seriously considering creating a single central database for much of the information published in the Callbook, as such a database would hopefully eliminate potential errors by a contributor sending in the wrong version of the information. Of course, some information will always be out of date in such a printed publication – callsigns will change, club committee members change because an AGM occurs between the closing date for the Callbook and its actual release date. This is part of modern life, but we believe that many prefer to have a printed resource to needing to refer to the Internet on a regular basis, where information might be expected to be able to be kept up to date.

In addition to comments on the Callbook, PubCom hereby calls for Expressions of Interest for persons willing to be part of an editorial subcommittee to assist the Callbook Editor in preparing the 2009 Callbook. Some members of this subcommittee might be located close to Melbourne, but with modern communication methods such as email, this is not a necessary prerequisite. We would be particularly interested to find a person to oversee the design and production of the master CD version of the Callbook. Anyone interested in participating can forward their written Expression of Interest to the Secretary of PubCom, Ernie Walls VK3FM. Ernie can be contacted via email at armag@wia.org.au or by mail via the WIA office.

Photographs for covers

We always welcome the submission of good quality photographs for consideration for publication in AR, the cover of the Callbook or any other publication that we might consider. Readers are reminded of the hints for photographs that were published in the Editorial in the August 2007 issue of AR.

"Over to you" contributions

I do welcome your "Letters to the Editor", which we publish under the "Over to you" banner. Of course, I exercise my right as Editor to publish or not – but if space is available, I usually publish.

I have received several contributions of the past months regarding BPL or PLC communications. Given that we have a WIA Working Party monitoring BPL activity in Australia, I believe that we do not gain much by publishing such letters in AR. I would urge all readers concerned about the real and future potential impacts of BPL technology deployment to lobby their local Federal politicians, especially as many may be new following the election. Political pressure is one way in which we may influence decisions.

No January issue

As has been the practice for the past couple of years, there will be no separate January issue of AR – it will be combined with the February issue. We plan to have it into our distribution system in late January.

Have a safe holiday season.

73

Peter VK3KAI

ar

Michael Owen VK3KI

Being a director of the WIA

This issue of Amateur Radio has the annual notice calling for nominations for directors of the WIA.

Over the past year the current directors have, on a number of occasions, exchanged views on what it means to be a WIA director and whether particular skills are needed for the future.

Naturally, while there is broad agreement, each director has his own slant on the question and so, while I try to synthesise the different views, please accept this as a personal view.

I think it is worth raising the whole question because I am sure that anyone considering nominating will think about what he or she can contribute to the WIA and then, when members are asked to vote, they will consider what each candidate can contribute, and hopefully look to a Board of directors with synergistic skills and experience.

The WIA Board does not meet personally very often, perhaps two or three times a year. Accordingly, the directors communicate sometimes by phone and mainly by email, more or less on a daily basis. That means that you do have to be able to express yourself adequately in writing. The monosyllabic response does not contribute much, and the point of exchanging views is to try and ensure that all points are properly considered.

And, you also have to read a lot. Much of what has to be read is dry, regulatory stuff. Certainly not scintillating! That is because the directors are asked to provide input on many policy issues, whether it is a draft Determination, a Request for Expression of Interest, responding to a discussion paper on issues that may have an impact on the Amateur Service, or just a report on an area where the WIA is represented. Much of the important work of the Board is involved in things that are not the fun of amateur radio, rather what many find much less interesting.

In addition, while each director may take a special responsibility for particular matters, such as contests or QSLs, the WIA relies on people who are appointed as coordinators or managers to look after those areas.

On the other hand, a director who takes responsibility for a matter has to ensure that the matter is brought to finality. You not only need the time to deal with the daily emails, but also to complete particular tasks you undertake.

But at this time the WIA is really facing challenges that may well determine its future. The retention of the ACMA examination management function and the other issues that hopefully will be raised by the ACMA outsourcing do affect where the WIA will go for the future.

We may, as a result of these matters need to consider whether the present premises can meet our needs, on what basis could the WIA undertake the as yet not fully defined outsourcing tasks, what financial commitment can we make, and how is it all to be managed.

Does that help identify the skills and experience that the WIA needs on its Board?

Actually, what the Board needs is a mixture of skills.

In my view, underlying the Board's approach to virtually every question, the economics of publishing a book or magazine, the management of the ACMA amateur qualification examination system, indeed the whole question of ACMA outsourcing, taking responsibility for the financial outcomes of the company, the subscriptions we charge, the insurances we seek, all involve a mixture of managerial, accounting, financial, commercial and other skills. The WIA would not be served by a Board made up solely of accountants any more than it would by a Board of only communication engineers.

Yes, of course we want true amateurs. But a mix of technical, managerial, commercial and professional experience and skills at Board level means that the WIA is better equipped to meet the challenges of the next period.

Does it matter from where people come?

One of the criticisms of the WIA structure before it became a single national body was that policy was determined by people representing a particular state or territory. It was said a position could be based on what was seen as being in the best interests of a group, rather than in the best interests of amateur radio as a whole. Today no director represents a particular group or area. Each director must act in the best interests of all members.

So, in one sense, it just does not matter from where a director comes.

But it is obviously important that the Board has a mix of directors from different areas. I am sure that if all directors came from metropolitan Sydney or Melbourne, they would have little understanding of the perceptions and needs of amateurs in other areas. The Board benefits from a mix.

It has been suggested that a thick skin is also needed.

Unfortunately, there is some truth in that. The Board cannot act to please all members at all times. If 80% of amateurs supported a Foundation licence during the consultation process, then 20% were opposed. Some of those who disagreed with the introduction of an entry level licence continue to disagree with the WIA working to make it work successfully, sometimes in an antagonistic way.

Some would like the WIA to be some sort of Spectrum Police. The WIA cannot take that role. Those who do not accept that position can also be antagonistic.

Above all else, the WIA must continue to attract new members. A director must be prepared to go to meetings and events where the WIA can be promoted.

Being a director of the WIA is nothing like being a member of a tennis club committee, where there is a monthly meeting and all correspondence is read out, every payment is discussed, and every issue like whether the club can afford better biscuits is discussed.

Being a WIA director means a lot of time, a lot of effort, a lot of reading and a lot of writing.

But, as the WIA faces new and real challenges, if you have the skills and experience and the time and the interest, then it can be totally satisfying, because you are working to secure the future of amateur radio.

ar

WIA News

WIA Director resigns

Robyn Edwards VK6XRE was elected a director of the WIA in 2006, taking office at the conclusion of the WIA Annual General Meeting held on 6 May 2006.

Unfortunately for the WIA, Robyn will be moving to New Zealand in the near future, and so has given notice of resignation with effect from 1 December 2007.

The Board has accepted Robyn's resignation with regret, recording formally in its Resolution the Board's gratitude for Robyn's contribution to the WIA.

On the nomination of Robyn, the Board has appointed Eddie Saunders VK6ZSE as a director to fill the vacancy caused by Robyn's resignation with effect from 1 December 2007.

Eddie is the VK6 Regional Advisor on the National Technical Advisory Committee and is well known in VK6 amateur circles.

Eddie takes the balance of Robyn's term of office which ends at the conclusion of the Annual General Meeting to be held in 2008, but he will be eligible for election in 2008 and has indicated that he will stand.

Icom gives 5 more D-STAR repeaters to the WIA

Just over a month ago, the WIA announced the gift from Icom (Australia) Pty Ltd of a D-STAR repeater to be located at Olinda in the Dandenong ranges, to serve the greater Melbourne area.

D-STAR is a digital protocol developed by the Japanese Amateur Relay League (the JARL) and stands for Digital Smart Technologies for Amateur Radio.

Now Icom and the WIA, concurrently with the official opening of the Olinda D-STAR repeater VK3RWN, have announced the gift by Icom of five further D-STAR repeaters to the WIA so that a D-STAR repeater will be able to serve the metropolitan areas of each of the other state capitals.

The experience in Melbourne has been used as the basis of formulating what is really a cooperative effort between a club, its individual experts, the WIA and Icom.

The WIA will consult with people in each state capital including the appropriate Advisory Committee to identify a club or group of clubs, supported by people with the necessary RF and computer skills, able to provide a suitable site and supply the ancillary equipment.

Icom will provide the D-STAR repeater and provide general assistance, and will maintain and repair the repeater on a warranty basis for 6 years.

The WIA will license the repeater and will meet the reasonable cost of broadband connection.

The agreement between the WIA and Icom that forms the basis of these arrangements makes it clear that each D-STAR repeater shall be open to all amateurs.

The WIA acknowledges with gratitude Icom's generous support.

WRC 07 concludes

The 2007 ITU World Radio-communications Conference ended on 16 November 2007, and Keith Malcolm VK1ZKM, the WIA nominee on the Australian delegation, is home after four very tiring weeks in Geneva, Switzerland.

The amateur service was allocated a new secondary band 135.7 to 137.8 kHz, with a one-watt E.I.R.P. power-limit.

Australian amateurs should be pleased with this LF allocation. In 1978, when Australia was one of the countries proposing the enlargement of the family of frequencies available to the amateur service by new bands at 10, 18 and 24 MHz at the WARC to be held in 1979, Australia also proposed to the Conference Preparatory Meeting an LF band around 200 kHz. Because of the fierce opposition of a number of countries, including the USA, that proposal was abandoned.

The proposal for a new secondary band at 5 MHz failed, despite a valiant effort from the CEPT to have a footnote inserted.

Similarly, the proposals for an agenda item for an amateur allocation at 5 MHz (and 50-54 MHz in Region 1) did not make the list for WRC-11.

The proposal for an amateur allocation of 15 kHz in the band 415-526.5 kHz is on the provisional agenda for WRC-11.

WIA President Michael Owen VK3KI said that all Australian amateurs should be very grateful that someone with the skill and experience of Keith was available and willing to represent them at the WRC-07.

WIA submits Expression of Interest

ACMA has published a Request for Expression of Interest for the "provision of certain statutory functions and administrative services associated with" amateur radio.

The "certain statutory functions" and "administrative services" are the provision of amateur qualification examinations, the issuing of certificates of proficiency and certain, largely undefined, functions in relation to the issue of callsigns.

The WIA has been providing the examination management function since 1992 in accordance with a Memorandum of Agreement.

The ACA Outcomes of the Review of Amateur Service Regulation published in May 2004 proposed that the management of the examinations, callsigns and the issue of certificates of proficiency be undertaken by a single external body.

The WIA regards its examination management role as critical, particularly since the restructure of the Australian amateur licences, and the introduction of qualified Assessors as part of a new approach to its amateur qualification role.

The WIA has lodged its Expression of Interest before the closing time, Thursday 8 November 2007.

That submission has involved a number of people, particularly Fred Swainston, the WIA Nominated RTO, Ron Bertrand, and all of the Directors and the Secretary who all reviewed and contributed to the Expression of Interest.

The Authority has indicated that it will advise the successful and unsuccessful parties in December.

WIA President Michael Owen VK3KI said that he would like to thank the members who noticed the ACMA advertisement of the Request and drew the attention of the WIA to it, and all who contributed to this most important submission.

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The Wireless Institute of Australia

ACN 004 920 745

Election of Directors

Call for Nominations

Pursuant to clause 14.1 (c) of the Constitution the WIA Board has determined that the election of directors shall be conducted by postal ballot.

Robyn Clare Edwards was a director to retire at the conclusion of the next Annual General Meeting but has given notice of resignation as director with effect from 1 December 2007. The Board has resolved to appoint ***Edwin Robert Saunders*** a director for the remainder of the term of office of Robyn Clare Edwards.

Accordingly three directors retire at the conclusion of the next Annual General Meeting which will be held at a time and a place to be announced but not later than 31 May 2008, namely Philip John Wait, Trevor Milton Quick and Edwin Robert Saunders. Each is eligible for re-election and Philip John Wait and Edwin Robert Saunders have offered themselves for re-election to two of the three vacancies.

Nominations are called for from others also seeking election as a director of the WIA.

A director must be a voting member of the WIA and must hold an Australian amateur radio licence.

Any person wishing to nominate as a candidate for election as director of the WIA must deliver or cause to be delivered to the Returning Officer by not later than 31 January 2008:

A statement signed by the candidate signifying his or her willingness to be a candidate for election as a director together with;

- the full name, age, occupation and callsign of the candidate, and
- such other biographical details or other information as the candidate wishes to accompany the ballot papers, but in all not exceeding 250 words.

Delivery to the Returning Officer may be made by hand when the WIA national office is open at:

Suite 10, 229 Balaclava Road,
Caulfield North,
Victoria 3161

or by mail to:

PO Box 2175
Caulfield Junction,
Victoria 3161.

Nominations received by facsimile or by electronic means cannot be accepted.

David A Wardlaw, VK3ADW
Returning Officer

Passed with flying colours!!

This some of what Jason Reilly VK7ZJA had to say about our radios last month in AR

.. solid and rugged ...comfortable to hold...the audio qualities are superb! This is one of the nicest sounding handheld radios ...The receiver is also astonishingly sensitive, ...On transmit, the Quansheng has pleasant TX audio, and delivers 5 watts on high power, 1 watt on low. .....the circuitry general finish is excellent...quite a few Quanshengs go into the hands of local amateurs, and generally speaking most are very happy with them...The factory in China has also been...supplying spare parts... for those units that had suffered damage outside the scope of the 6 month warranty too, which is very reassuring. The Quansheng factory has also taken on board some suggestions from local hams on what they might do to improve their handhelds...(and) has implemented an Australian suggestion to abandon the simple drop-in charger in favour of an intelligent design ..

For $100 (yes, Australian Dollars)...this radio represents absolutely phenomenal value.

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A simple superhet receiver for 160 metres

Drew Diamond VK3XU

Interest in 160 metres continues to grow apace. Just why there should be such a surge in activity is perhaps not difficult to understand. It is a challenging band. You have to know your subject in order to get good results. Night time propagation offers fascinating but variable possibilities, where long-haul DX is worked regularly only by the keen operator who has studied the band, and honed operating skills and station equipment to explore the rather peculiar characteristics of 'Top-Band'. Daytime ground-wave working is another attraction. An (usually home-made) AM transmitter of moderate power, possibly 20 to 100 W into a reasonably effective vertical antenna, will put out a signal that can generally be heard right across (for instance) Melbourne and surrounding districts. Locally, the long running 11 am 'Coffee Break' session is increasingly well attended.

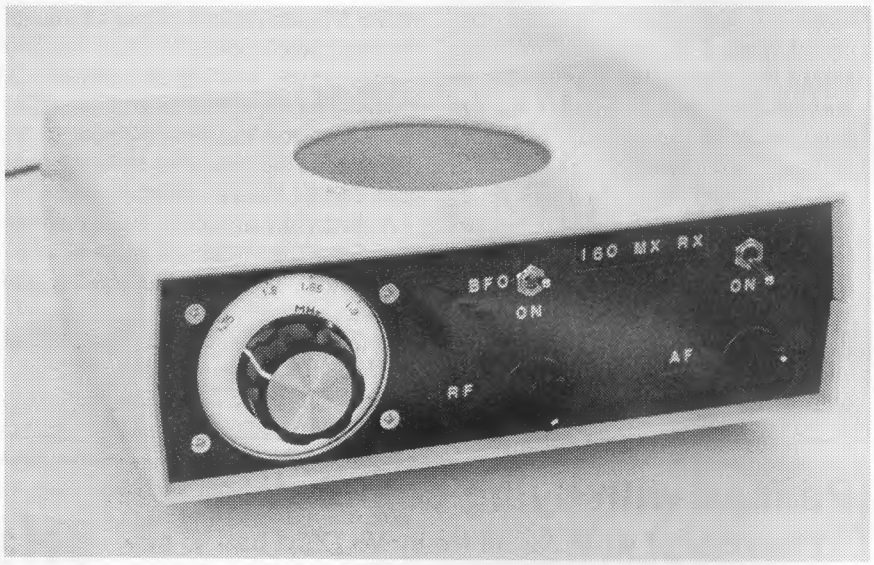

Photo 1: The simple superhet receiver for 160 m.

An ordinary broadcast band radio can be 're-tweaked' to allow coverage up to perhaps 1.9 MHz, but sensitivity may not be sufficient to permit reception of weaker signals. Nor is there provision for demodulation of SSB and CW modes.

Offered here are plans for a superhet receiver that covers 1.75 to 1.95 MHz. Sensitivity is such that a 0.5 µV signal is plainly audible. Detected AM signals have very good fidelity and an (optional) internal BFO allows for SSB and CW reception. A useful amount (about 30 dB) of AGC range is provided by the MKT484 AM radio chip. The set operates from a nominal 6, 9 or 12 V dc supply, which may be from a battery or a regulated mains power supply unit. Peak current demand rather depends on audio volume, but is typically about 50 mA. Although by no means 'contest-grade', this delightful little receiver should nevertheless provide a simple and replicable entry to Top-Band listening.

Circuit

Experimenters will remember the ZN414 AM radio chip, which unfortunately is no longer available. A workable replacement is the Rapid Electronics (UK) MKT484 (Reference 1), which provides amplification, AGC and AM detection all in one TO-92 three-leaded package. Numerous patterns have been published for broadcast band use (see Reference 2 for a typical example). The chip is good to about 3 MHz, so it admirably suits, and greatly simplifies, a 1.8 MHz application.

A popular NE602 (see Figure 1) serves as the mixer whose on-board oscillator further reduces component count (compared to a discrete component job). We only need to tune over about 200 kHz, so input selectivity is provided by a simple two-resonator band-pass filter (thus dodging the need for frequency tracking considerations) using stock 22 µH chokes as inductance elements. The NE602 is responsive up to 500 MHz, hence the first 22 µH coil is arranged to be effectively in series, and with capacitors in shunt with the input offers substantial attenuation to unwanted HF and UHF signals.

Selectivity, about 8 kHz wide, is provided by two ordinary 'transistor radio' type IF transformers coupled as shown, and presented to the input of the MKT chip. Intermediate frequency (IF) shall be 470 kHz so that, when the BFO is on, the 4th harmonic will be 4 x 470 = 1,880 kHz, thus placing the harmonic outside our band. Residual IF signal exists together with detected audio at the output of the MKT484, so a rather large decoupling capacitor (100 nF) is recommended by the chip maker. Additionally, a 1 mH (1,000 µH) choke was found necessary at the input of the LM386 audio amplifier chip (the MKT484/LM386 combination tends to become regenerative or 'super-sensitive' if insufficient decoupling is employed).

Construction

The prototype receiver is housed in a Dick Smith plastic case measuring 200 x 65 x 160 mm. A suggested 'paddyboard' style circuit board layout (Reference 3) is pictured in Photo 2 and Figure 2.

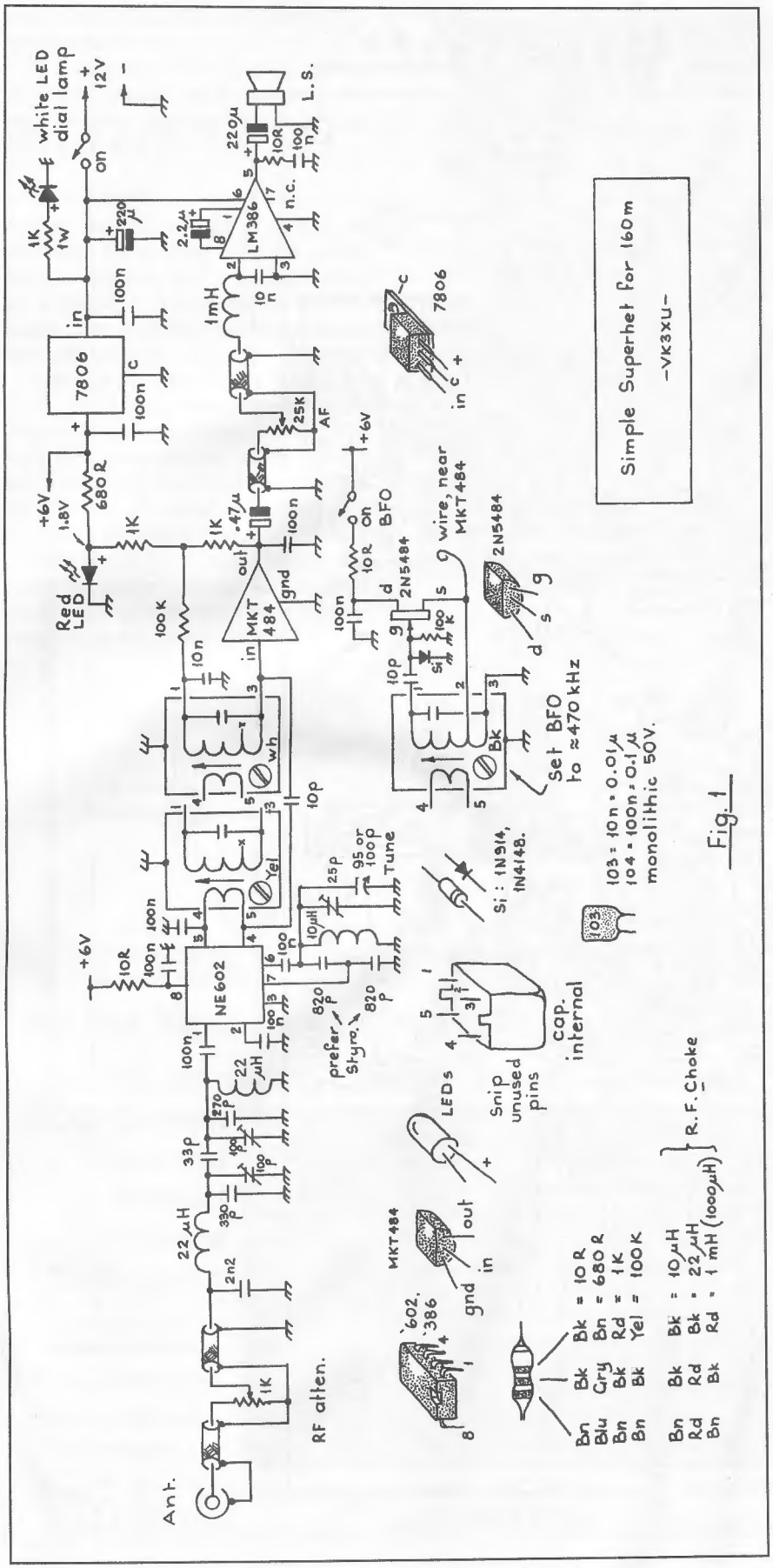

Figure 1: Schematic of the 160 m simple superhet receiver.

The NE602 (or SA602 or NE612) and LM386 are fitted into IC sockets that, in turn, are soldered upon the copper side of 19 mm x 4-strip 'substrates' of Vero board. Remember first to separate the pins each side of the Vero with a shallow (junior) hacksaw cut. Take care when soldering the sockets that the pins do not poke right through and short to the ground foil. The substrates are super-glued (sparingly), copper side up upon the main circuit board.

All unused IF transformer pins should be snipped to prevent them shorting to the ground foil or to adjacent pins. Carefully bend the required pins to permit their connection to 'paddyboard' islands.

For a tuning range of 200 kHz, the oscillator variable capacitor should have a maximum capacity of 95 (like the MSP of the prototype) or 100 pF. The stability of the trim capacitors normally on offer is unimpressive, so I have used a Philips 25 pF 'beehive' air trimmer for the oscillator. Ordinary ceramic 100 pF trimmers are adequate for the input filter. The 820 pF caps should be mica or 'styroseal' (see Parts below).

Every constructor has their own ideas about dials, so just a few words. A 6:1 planetary drive is mounted upon an aluminium plate, which in turn is fixed to the front panel with four 3 mm x 25 mm countersunk screws and spacers (visible in Photo 2). The dial is a 49 mm diameter disc of opaque 3 mm Perspex. I suggest removing the gloss by rubbing with fine emery, thus preparing the dial disc for later calibration using fine pencil markings.

For the dial window, an exact-fitting disc of three mm clear Perspex is machined to 50 mm diameter with a slight taper, or bevel, so that it is a neat bung fit in the front panel. The suggested flexible coupler is simply a length of 1/4" (6.35 mm) inside diameter rubber fuel hose, held captive with two ordinary pliers operated hose clips. The dial is illuminated from behind with a white LED, arranged so that it radiates through a hole in the aforesaid aluminium plate. The LED and 1 kΩ 1 W dropping resistor may be soldered to a suitably sized and segmented piece of circuit board,

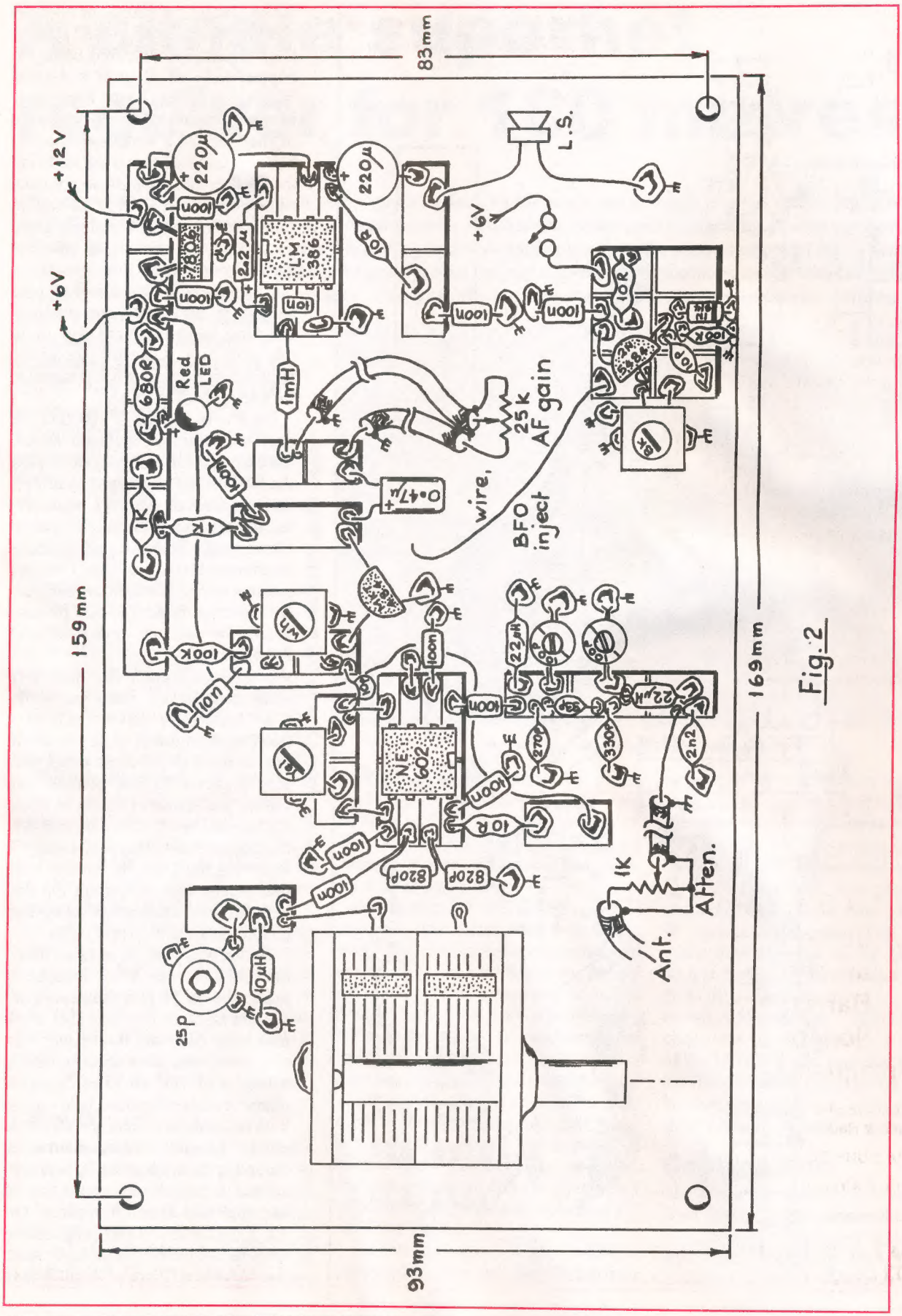

Fig.2

Figure 2: A suggested component layout on the "paddyboard" circuit board.

which in turn is held in place by the two uppermost screws.

If it is required to operate the set from a 6 V supply, simply omit the 6 V regulator chip, and connect pin 6 of the '386 to +6 V.

Operation

Inspect your soldering for quality and accuracy. Look especially for solder bridges between Vero tracks and clean up with solder-wick as necessary. Check that all polarised components are correctly oriented.

Apply power. The LEDs will glow. With the gain potentiometer fully clockwise, you should hear just a soft hiss, indicating that the set is 'gainy', and probably working. For initial adjustments, the ideal instrument is a frequency counter and high-impedance (CRO) probe. Carefully connect the probe tip to pin 7 of the NE602, then adjust the 25 pF trim capacitor so that the oscillator is adjustable (with the tuning

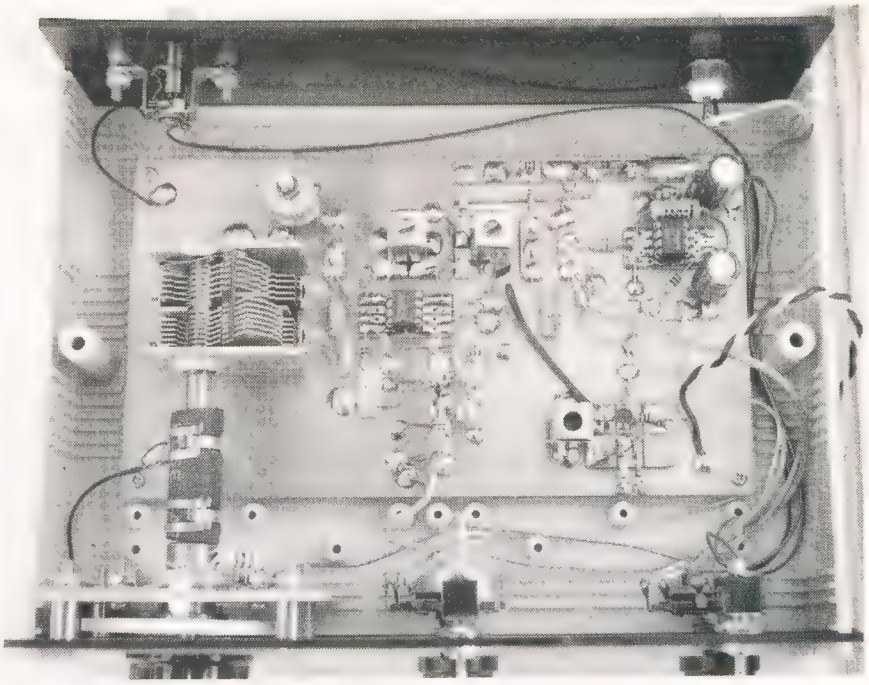

Photo 2: Inside view of the simple superhet receiver for 160 m.

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tuning capacitor) between about 2.220 and 2.420 MHz.

Switch on the BFO and apply the frequency counter's probe to the source of the 2N5484. Then adjust the black BFO slug so that 470 kHz is generated. The BFO injection wire should be positioned (initially) about 10 mm from the MKT484. Listen to the hiss from the speaker, and adjust the yellow and white slugs to bring the IF frequency on to 470 kHz. You should hear a perceptible increase in hiss when these are peaked.

Connect a signal generator, if available, set to deliver perhaps 20 µV at 1,850 kHz, modulated 50 % at 1 kHz, then carefully peak the two 100 pF trim capacitors of the input filter for maximum signal (BFO off). When the set is properly adjusted you should be able to easily hear less than 0.5 µV between 1,750 and 1,950 kHz. Without a generator, the same adjustment can be done using signals or noise from an antenna. When optimised, the set should sound (perhaps surprisingly) lively.

With the BFO on, carefully position the injection wire so that the gain (background noise) just begins to reduce. This will be found to be about right for SSB and CW detection.

Parts

It happens that most of the components for the prototype were purchased from my local Jaycar store, including MK484 chip; ZK8828 IF transformers (coil set of four LF1050), 100 pF trim capacitors; RV5722 10 µH choke (coil); LF1522 22 µH choke; LF15263 and 1 mH choke LF1546. However, similar suitable items are also available from our usual suppliers, including Altronics, DSE (the plastic box is a DSE P/N H2505), Semtronics, Rockby and Electronic World. Additionally, 820 pF styroseals, 25 pF Philips 'beehive' capacitors and 3 mm Perspex may be purchased from Electronic World (Ph 03 9723 3860). NE602 (or SA602 or NE612) chips may be mail-ordered from several of the US mail order suppliers. I always receive good service from Ocean State Electronics (www.oselectronics.com).

References and Further Reading

1. www.datasheetcatalog.com
2. "The "Practical Wireless""; I. Liston-Smith, G4JQT, *Practical Wireless*, June 2003.
3. "'Paddyboard' circuit construction - revised"; *Amateur Radio*, May 2005.

Photos: Andrew Diamond.

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Silent key

John Roberts VK1ZX

John Roberts VK1ZX, ex VK1ZAR died on Thursday 15th March, aged 76.

Ed Penikis VK1VP, Ted Pearce VK1AOP and Andrew VK1DA attended the funeral. We had all been on various committees in the past with John, including the Canberra Radio Society in the 1950s and 60s and the VK1 Division of the WIA from the 70s. John held various positions on committees through the years but due to his financial background many would remember him holding and competently carrying out the treasurer's role for many years. We used to hold all committee meetings at members' houses so quite a number were held at his house and we all became well known to his family.

At the funeral three of his grandchildren presented a very moving and affectionate summary of his life. They focussed on his dedication to his family but also mentioned Amateur Radio as one of his main hobby interests. He also had a long interest in shooting and was a proficient wood and metal worker. He also enjoyed lapidary and polished stones as an interest. He was particularly caring for his children and grandchildren, making sure they could achieve the best possible and helping them by showing them and teaching them skills in bushcraft, woodwork, metalwork and other interests.

John's widow Margaret thanked us for attending. I spoke briefly with one of his daughters and she was pleased to hear some of my recollections of events I remembered involving John, including his efforts to pass the Morse exam and his participation in Ross Hull, Remembrance Day and John Moyle Field contests.

John was a keen radio amateur and would have been more active on the air but for his family commitments which were number one on his list.

In the late 60s John was posted to New York with the Department of Treasury to take up the post of duty programmer for the New York office of the department. The tasks of this job included computer programming and, thanks to John's own skills, minor hardware repairs. When I coincidentally applied for the same job about 6 years later, he immediately briefed me on some of the tasks I might encounter in the course of the posting.

John was a very capable handyman and was able to fabricate many small parts needed for repair jobs around the office and the home, sometimes improving on the design in the process.

While in the US he was very active on six metres and came back to Australia with a renewed interest in that band. Several years running in the 70s he brought his high power (at that time) transceiver (the Swan 250) and a six element beam for six metres up to Mt Ginini for the John Moyle Memorial National Field Day contest. The beam had a boom length of about 24 ft from memory and made quite an impressive setup.

John held a limited licence for many years but worked steadily on his Morse proficiency. It was great to see him succeed in passing the 10 wpm test and gaining the full licence he had always wanted. Once he had HF access, he put up an HF beam and had a great time working DX on those bands.

More recently he suffered a stroke and battled leukaemia.

John will be remembered well by his radio friends.

Submitted by Andrew Davis VK1DA

Editor's note: This was submitted in early May, but missed being published.

A 160 metre power amplifier using a single low cost MOSFET

Leigh Brown VK3TOQ

This article describes a linear power amplifier for 160 metres using a single MOSFET device. My radio only puts out a maximum of 2 W, so I needed a power amplifier to rise above the ambient noise. I decided to use the IRFP460 MOSFET as it was the biggest device around and very low in cost. I first thought of using push-pull but found that one was enough.

I have used a Pentium 4 heatsink and fan to cool the MOSFET. When placed fan down, the heatsink is insulated, so no washer is required and the MOSFET is bolted directly to the heatsink with a little grease. The fan is continuously powered by the 12 V bias supply. All components are mounted on some copper sheet including the MOSFET source. No circuit board is used. The construction method is simply to solder the ground ends of every component to the copper ground plane as close as possible to the MOSFET.

One big problem with any RF power amplifier is finding suitably rated capacitors. All the capacitors in the drain circuit and output filter should be mica or porcelain, both of which are very difficult to obtain. The voltage rating should be 400 to 630 V DC. Polystyrene or polypropylene capacitor types will work but polyester types sit there and get hot so should not be used. Similarly any ceramic types that I tried got very hot with the currents involved. I ran out of suitable mica types so the drain tuning capacitors ended up being multiple 150 pF 400 V types that did not get hot when in use after extensive testing. The drain capacitance was increased until the waveform began to look like a sine wave.

All the bypass capacitors in the input stage were polyester and most of these were 1 uF as I had them and they functioned well at the low powers in this part of the circuit. The bypass capacitor at the output transformer was a 10 uF polypropylene block capacitor as I had it and it was easy to mount on the copper sheet. Similar bypass types can be purchased from all the local suppliers. Multilayer ceramic types will also work in the bias circuit. The value of the bypass capacitors is not that critical. As most capacitors of this size are 100 V rating, they are suitable.

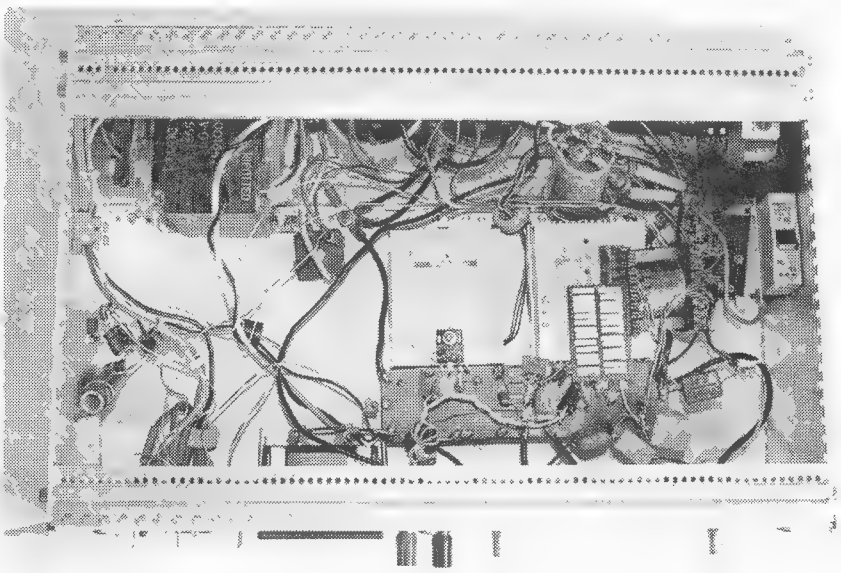

Photo 1: A view of the underside of the unit.

I found that the amplifier should be initially powered with a 5 A 35 V current limited supply during setup and tuning. The temperature compensation is via three 1N914 diodes in series, glued with epoxy to the MOSFET case. The quiescent current is set to 100 mA by the trimpot. See Photo 1 for a suggested layout to the amplifier. Refer to Photo 2 for a suggested layout of this amplifier front panel on a nineteen inch rack case.

The transformer cores were all available locally. I wound them with multi-strand wire. I had a limited quantity of Teflon covered wire which worked well. PVC covered multistrand wire should work at this frequency. The output transformer could be a little tricky to obtain but may be obtained from old computer power supplies. I obtained mine new some time ago.

The following is a list of important parts with local suppliers:

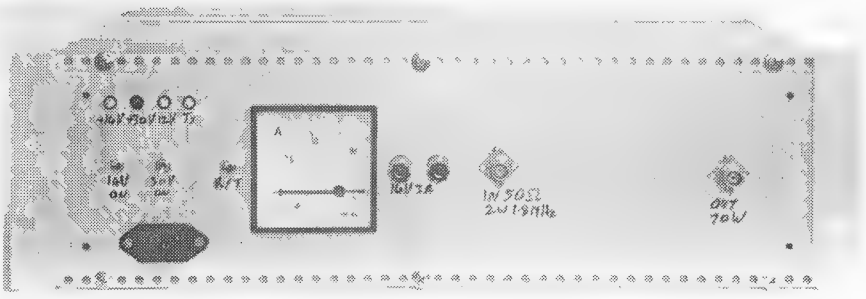

Photo 2: The front panel.

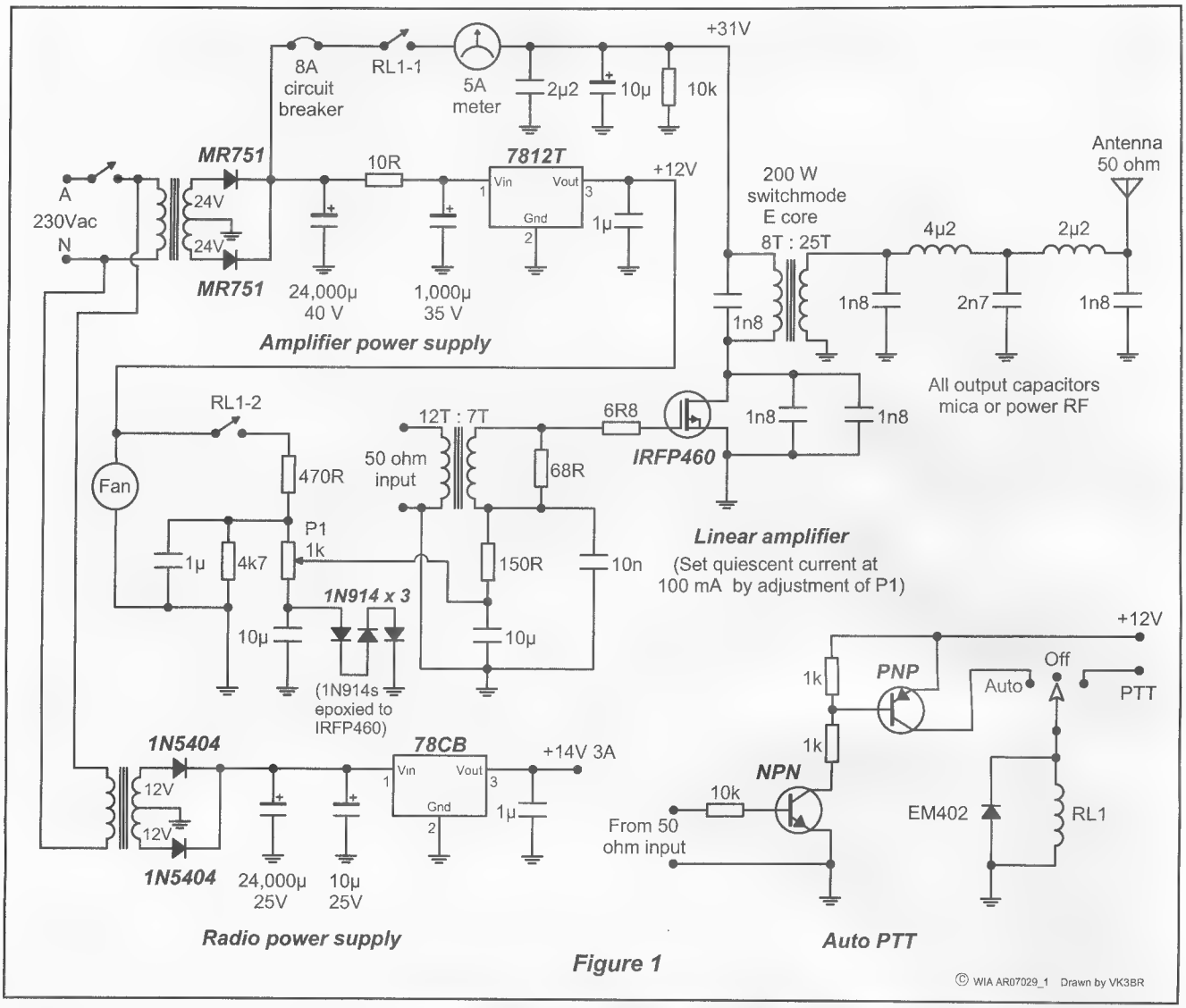

Figure 1

Input toroid	Jaycar LO1230 18 x 10 x 6
Output Transformer	200 W switchmode E core with 1.2 mm airgap centre leg. 52 x 50 x 14 mm
Filter choke 4u2	26 T Amidon T 80-2
Filter choke 2u1	21 T Amidon T 80-2
MOSFET IRFP460	Rockby 31915

I have added a power supply to power the radio as it was an easy addition. I have also added an input RF detector to turn on the power to the amplifier. A changeover RF relay is not necessary as with no bias and no supply, enough RF leaks from the antenna to the radio through the unpowered MOSFET. Two bleed resistors are used to drop the bias and main supplies to zero when not used to allow the RF through the MOSFET. Refer to Circuit 1 for details of the amplifier.

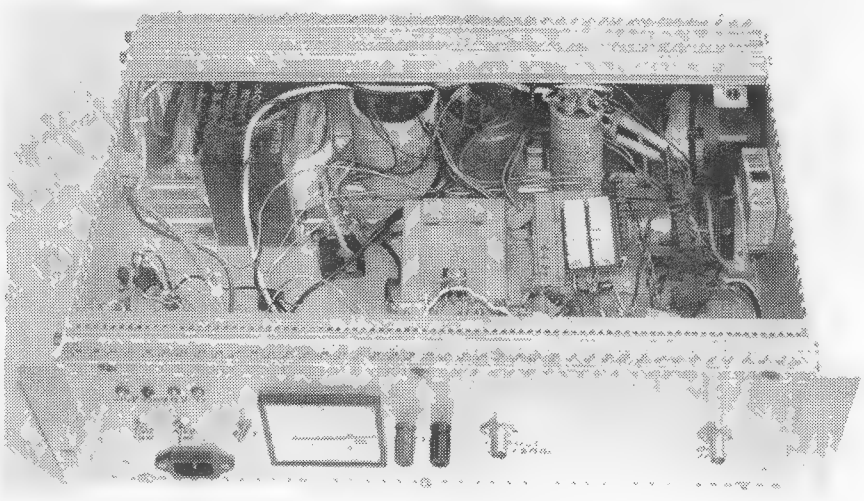

Photo 3: A view of the front panel and inside of the unit.

I simply built a single low cost MOSFET amplifier to find out what could be achieved and I obtained best performance at 1.2 W in for 60 W out.

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HF antenna 'realities'

Felix Scerri VK4FUQ

There is an old saying in ham radio circles that goes, 'Nothing makes an antenna work better than putting it up higher'! I am rapidly coming to the opinion that a more true statement has never been said! Over the last year or so, one distinct impression I have gained resulting from my many seemingly diverse evaluations with simple one element antennas is that, especially when only moderate mast height is available, at least with all 'typical' horizontally polarised antennas such as dipoles, inverted Vs and full wave loops (mounted vertically), performance is better with increased mast height.

This is possibly expected, however an aspect related to this obvious reality is the notion of antenna 'effective height'. In the excellent book by L A Moxon, *HF Antennas for all Locations,* the aspect of 'effective height' is mentioned more than once, and it is interesting to note that certain antenna types (full wave loops when mounted vertically, to be specific) are handicapped more markedly in this respect, depending on the physical configuration and loop shape. My own observations (sadly) confirm this, based on many regular contact signal strength observations. In many cases the signal strength differences are not all that great, however there is no doubt that the 'higher' antenna always wins out in general terms, and almost without exception, on DX paths.

Speaking of full wave loops specifically, it is sadly apparent that the Delta Loop, when erected as a triangle (with the apex up), does indeed suffer from considerably reduced effective height (as noted in the Moxon book, Reference 1), although the negative effects of this can be offset somewhat by additional mast height, where this is practical. This is actually a little sad as the Delta Loop is a favourite loop configuration of mine and it does have some very useful virtues, such as a high degree of noise cancellation. However it must be grudgingly conceded that comparisons between a Delta Loop (apex up) and a Quad loop erected at the same 'top' height have shown that the Quad Loop is slightly, but consistently better overall, presumably mostly because of slightly greater 'effective height'. A pity!

The single Quad and Delta Loops inherently have a slight signal 'gain' over a dipole, with the gain of the Quad shape being slightly greater than the Delta (Reference 2). Interestingly enough, incidentally, based on my own observations, greater antenna 'effective height' would appear to be more advantageous and more valuable in practice than this slight antenna 'gain' (that old proverb again!). Again in the Moxon book, the simple inverted V dipole is given considerable praise and is recommended as an antenna with maximised 'effective height' and therefore better performance, despite the unity gain profile of the simple inverted V dipole (Reference 3). Again, my own long term observations confirm this recommemdation.

With a mast height of slightly over ten metres available to me (on the 20 metre band), it is my feeling that my simple inverted V works best overall based on long term signal strength observations, with the Quad loop, at the same top height, being a (very) close second. It is indeed gratifying that such a simple, easily erected antenna works so well. Perhaps it is just me, but I have always had the belief, possibly incorrect, and expectation that something a little more complex should be better. Perhaps it is not necessarily so! Additional complexity does not always result in improvement, at least with simple single element antennas at 'lowish' mast heights (and other things in life too!)

Years ago, a fellow amateur in our local area extolled to me the general excellence of his simple inverted V dipole. At that time I remember being a little sceptical, but in hindsight I suspect he was right, and the basic reason probably came down to increased 'effective height' more than anything else, along with a basically very good antenna design, as I have since found myself. It pays to never lose sight of the all important basics! The lesson is then, if mast height is limited, then it is probably best to go with a simple antenna like a horizontal dipole or inverted V dipole where one can take advantage of optimised 'effective height'. Real antenna 'gain' is great to have, but it is essentially wasted unless greater mast height is available to do it justice (at least on HF)!

References

1 L.A.Moxon, 'HF antennas for all locations', *RSGB*, pages 152, 153.

2 Dr James L Lawson, *Yagi Antenna Design*, chapters 4-11, 4-12.

3 L A Moxon, 'HF antennas for all locations', *RSGB*, pages 164, 214.

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Putting metal radios into plastic cars

Warren Stirling VK3XSW

Some time ago I came into possession of a Codan 8528B HF radio, together with a matching mobile auto tuner, the 9350, which had the rigid mobile antenna and spring base fitted. To make matters more intriguing, this particular unit is the remote model, intended for (mostly) vehicle installation. All the original brackets and cabling were included, even the power cable, although not an appropriately rated fuse-holder. Some research led to the local Codan agent who supplied what, he assured me, is the standard Codan automotive fuse-holder. This less-than-subtle unit (although it is way more discreet than the 9350 tuner!), came with matching fuses.

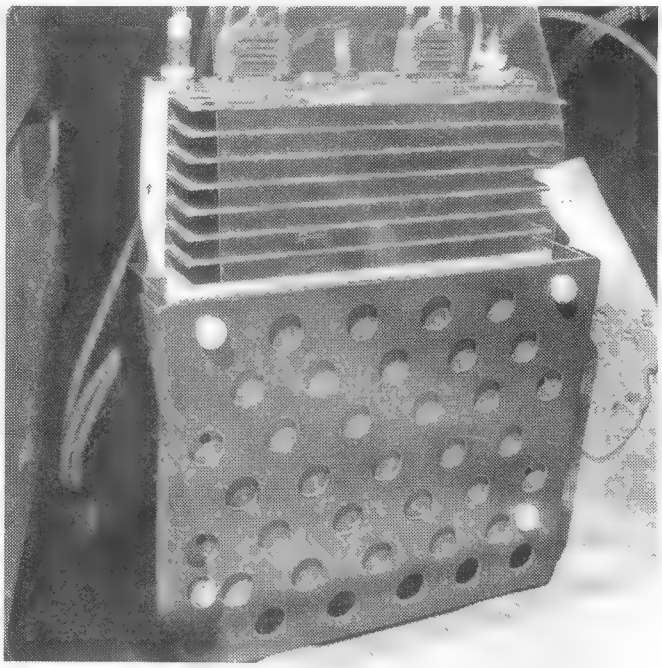

Photo 1: Codan 8528 radio mounted in car boot.

Installation planning

Having all the parts of the Codan HF radio together, my attention turned to the intended installation. The only real problem was that my car, while reasonably recent, was not intended to have anything retrofitted to it.

The first step was to explore the car in order to find out where the four parts of the radio system (fuse holder, radio unit, control head and auto tuner) would fit. The final placement was almost entirely dictated by a process of elimination. The radio unit had to go in the boot as it would not fit under any of the seats. The control head went in the centre driver's console because there was no place on the dashboard to mount it, and the fuse-holder went as close to the battery as it could be mounted. The auto tuner ended up at the rear of the car (although there are legal limitations on where an object of that size can be placed if it is in the driver's field of view).

The next step was to find out if I could run the power cable from the battery at the front of the car to the radio unit in the boot. This was the largest power cable I have ever seen connected to a mobile radio but after several hours of increasingly frustrated investigation and inventive cursing, I found what must be the only possible route for it.

With the power cable run planned, closer inspection of the car brought me to the conclusion that custom-made brackets would be the only way to go if I was going to defeat the intentions, unwitting though they may have been, of the car's designers. A trip to see the parents was planned, with the ulterior motive of getting assistance in the design and fabrication of the brackets from my father, a retired toolmaker and paranoid metal basher. A few man-days or so later the brackets were tested for fit and then I had them powder-coated.

Installation details

Photo 1 shows the radio unit mounted in the boot using the original radio bracket and the first of four custom brackets, which is bolted through the floor of the boot. The transparent plastic sheeting is there to direct water away from the radio unit if the boot seals leak (thanks for the tip, Roger). The braided cable you can see in the background (top right of Photo 1) earths the radio unit to the car body, as the Codan bracket supports the radio on plastic runners and so cannot provide a reliable low-impedance electrical connection. A note for some of the younger amateurs and also some of the designers of the more recent radios: the big black shape you can see at the top of the radio, with the horizontal fins, is called a heat-sink – it is a passive way to get rid of heat. You do not often see them on modern radios, where fans that can fail tend to be used.

The control and RF cables from the radio to the auto tuner are protected by a split, corrugated plastic tube, available in several sizes from any automotive electrician. They exit the boot through a conveniently placed blind grommet to the right of the radio and are routed past the fuel filler pipe in the passenger rear wheel-well, along a rail under the boot and onto the custom-made tuner bracket. This bracket also provides a solid earth point for yet another earth braid (visible in Photo 2) which runs from the base of the 9350 auto tuner to one of the mounting bolts for the tuner bracket. While some of the bolt heads have surface rust evident, there is none on the threads or the earth braid, thanks to the prior application of a ridiculous amount of Vaseline.

Photo 2 shows the lower part of

the auto tuner, with the control cable terminating in a military-style multi-pin connector, above the RF cable fitted with a PL259. Both these connections have been weatherproofed with self-amalgamating tape. Of interest will be the padlock at the bottom of the picture; the tuner mounting stud provides a hole for a padlock, so of course I have used one. You can not see the large nut that screws onto this mounting stud because it has a deep steel shroud around it to make its removal more difficult.

The remote control unit is mounted in the centre console as shown in Photo 3. The two Philips head screws mount the third custom bracket, going through the plastic of the console and into a metal plate behind. The shape of the bracket allows the driver to see the front panel of the control unit (although not while driving) and the pocket in the centre console can still be used, most often as somewhere to put the microphone. The speaker for the Codan radio is mounted in the front passenger foot-well at the top of the kick panel, where it is out of the way of intruding feet. The control cable from the radio unit in the boot, which was run in with the power cable, enters the cabin under the front passenger door sill cover, and runs under the front passenger seat to the control head.

The power cable was run in with some difficulty, requiring several more hours of disassembly effort and even more inventive curses concerning the previously cursed car designers. This cable run starts at the radio unit, follows the manual boot release cable into the car cabin at the passenger-side C pillar (the pillar at the corner of the rear windscreen) and continues down to the rear door sill (after removing the rear seat). Removing the front and rear interior door-sill covers showed a nice easy path for the cable to run, at least as far as the bottom of the A pillar in the front passenger foot-well. At any point where the power cable passed near a sharp metal edge I shrouded it with plastic cut from a milk container, which is easily obtained and works well for cable protection.

Removing the glove box and the plastic kick panels in the foot-well let me run the power cable to a large rubber grommet where part of the wiring loom for the dash exits the cabin. To get at the outside of this rubber grommet merely required jacking up the car, removing the passenger front wheel and the splash guards inside the wheel-well, and .....

Having run the power cable as far as the battery, the fourth custom bracket was fitted using two existing bolt holes, and the hefty fuse-holder was installed. The wiring to the radio unit and the positive battery terminal was shrouded in more of the split, corrugated plastic tube, but of a smaller size. The Codan fuse-holder is made from bakelite, to resist the heat found in engine bay, which makes plastic fuse-holders brittle, crumble and fail.

The negative battery connection for the radio was fitted off with a soldered lug of the appropriate size. The lug was then installed under the bolt that anchors the main negative battery cable to the car body, NOT directly to the battery (with yet more Vaseline applied to the lug and the bolt thread). The reasoning for this is as follows: if the negative battery lead goes high resistance for any reason, the starter motor current will try to find another path to the car body. And if the nicely grounded radio is the only path, then a very large current will flow through the radio for as long as it takes it to go open circuit.

Results

So after some investigation, careful planning, four custom-made brackets and a couple of man-days of labour, the Codan HF radio was installed in the car and working. The original rigid Codan whip works really well at keeping mobile flutter to a minimum as it does not flex very much, even with the spring base. The problem I have with it around town (and at home where I have a carport) is the height needed to clear the whip, the top of which is 2.94 m above ground level. To overcome the clearance problem, I obtained a very flexible stainless steel whip and had a base made that fits the 9350 auto tuner. This is still tall, at 2.52 m from ground level to the tip of the whip but, being very flexible, it bends easily when low flying carports, car parks, trees and so on are encountered. Mobile flutter is higher, unfortunately, due to its flexibility.

One unintended benefit that I have found - it is easy to find my car in a car-park; just look for the whip!

Photo 2: Codan 9350 auto tuner mounted on car.

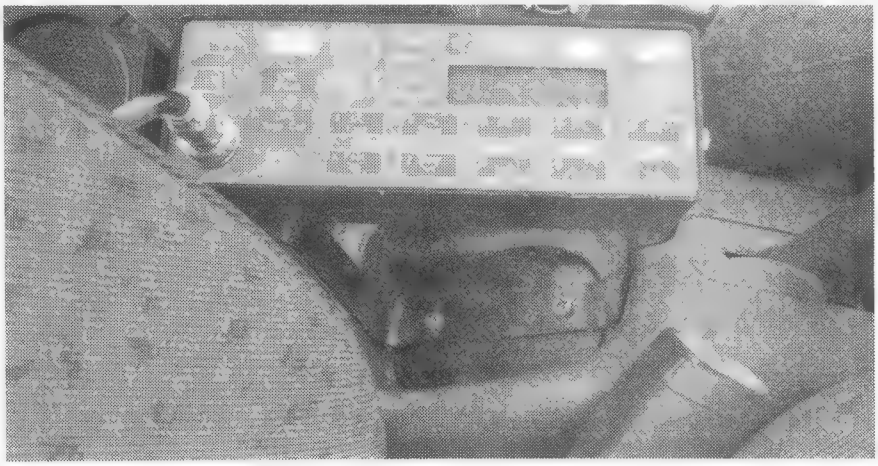

Photo 3: Codan remote control head mounted beside driver.

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Cliff Bilston VK3CB

My story starts back in the mid to late 1970s, with an interest in communications. I was keen to understand more about it as I spent a lot of time in the outback of Australia.

I should also say that as a wild pig hunter, and keen photographer, spending many hours in the outback, radio was a big part in communications for hunting purposes. A good friend and hunter, in the town of Ballarat where I lived at the time, said we should try these CB radios out in our 4 x 4s while flushing pigs out of thick scrub; which would make it safer! We would be able to inform one another of our location and if any pigs were heading in our direction. So, we did.

By now you will be saying where is this going?

Well, one time while we were flushing pigs from heavy cover, our Winchester 30-30's firing shot after shot, while we also communicated with one another on the CB, and where, to the outside world it must have sounded like all hell had broken loose, a voice came over the radio saying, in a very American voice, 'Man, that's the wildest hog hunt I have ever heard'.

Well, after a long chat we wrote to one another, where he asked me to do my amateur radio exams, and also sent a lot of information about the hobby. I wrote back informing him that I would have a good look at the hobby, but was unsure if it was for me as I had no back ground in electronics. The rest, as they say, is history.

With the help of a number of amateurs from the Ballarat Radio Group I made it through to get on air. I joined the ranks of amateur radio as VK3PAF. And within six months of obtaining my novice call

Cliff with the impressive UDSA-CA certificate

I had worked all states in the USA with 10x10 numbers, worked 200 countries and had this radio bug well and truly. After a lot of hard study, and obtaining a pass in the full call examination, I changed my call again, to VK3CCB. In later years I made the change to my 'vanity' call, VK3CB.

I thank the local Ballarat amateurs for all their help, notably Stan Widgery VK3SE SK, Bob Terrill VK3BNC, Ian McDonald VK3AXH, and the tutors from the club classes who all had a hand in helping me.

I was talking to another amateur in the town where I lived, Geoff Smith VK3ADB. He said to me that I should try and do this…it was the CQ Counties Award Record Book. I looked at it, and at the number of counties, and shook my head. It would only be a dream if I could work them all, I thought, and in the draw the book went for many years. It came to light one day and I said 'I CAN DO THAT', and I subsequently did. I now

The VK3CB QTH

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New

Tet-Emtron Vertical Range

New Tet-Emtron Vertical Range

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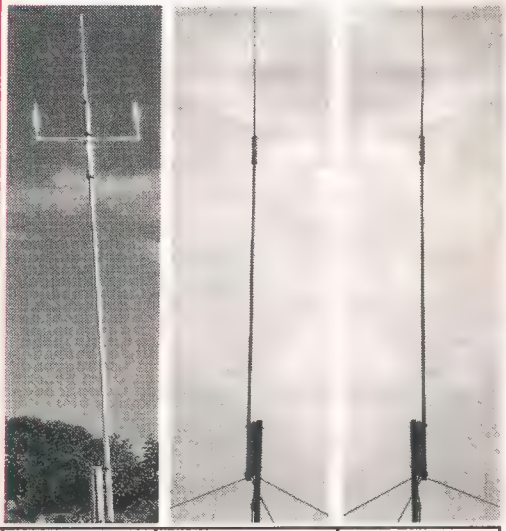
See the web site for more info and a complete dealer list.

TEV-4 TEV-3 TEV-3 Warc



Antenna	TEV-4	TEV-3	TEV-3 Warc
FREQUENCY	7, 14, 21, 28 MHz	14, 21, 28 MHz	10, 18, 24 MHz
ELEMENT HEIGHT	4090 mm	3800 mm	5025 mm
FEED IMPEDANCE	50 ohm	50 ohm	50 ohm
Max. RADIAL LENGTH	10.7 metres	5 metres	7.5 metres
SWR	1.5 or less	1.5 or less	1.5 or less
POWER RATING	1 kW	1 kW	1 kW

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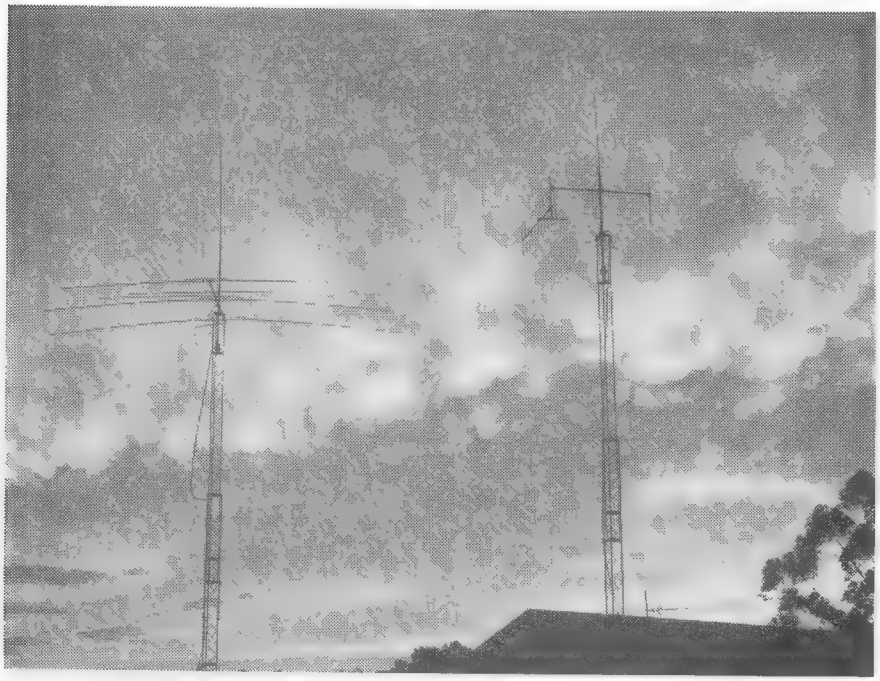

A view of the antenna farm at VK3CB, with an impressive sky

have USA-CA # 1078. It was a task of mammoth proportions in that I had just over 8,000 contacts to confirm the 3,077 counties required at the time.

This achievement is a very difficult thing to do from this part of the world, as our QSO window to the USA is so small, and but for the mobiles on 14.336 MHz and the return rate of MRCs (Mobile Reply Cards) it would take many, many years to achieve. The county net is run by the Mobile Amateur Radio Awards Club, which also provides a nice wall plaque and award. I would recommend the net to anyone wishing to try and work all counties.

MARAC has a site that you can get the required information from: countyhunter.com

It has many pages of information on where the mobiles will be and what county they will be giving out. The mobile net is very strict on how you make calls, so listen for a while to get the idea, and then make yourself known to them.

The goal of obtaining the 'United States Of America' County Award, which is sponsored by CQ, the amateur radio journal, is the jewel in the Crown. This beautiful award takes pride of place on the wall, among many other awards, in my shack. I'm not saying it is easy, it is not. But when you have reached the goal and it hangs on the wall, you have a real sense of achievement.

This award has made me many friends in the USA, and a number of them have stayed with us while here in Australia. I must say that it was good to have a number of amateurs from around Australia help out with information and friendship, while themselves working for the award. Some of these amateurs included June VK4SJ, Bernie VK4EJ, Graeme VK5AQZ, Rex VK3MW, John VK6NZ, and the late Jim VK4BS. They were a friendly bunch of dedicated county hunters.

To work the counties it is necessary to use mobile reply cards, which is a multi contact QSL card that the mobile stations sign as correct when you fill one in and send it to them direct or through a QSL manager, as I did. I must say thanks to all the stations that returned my cards and gave me the counties. Most of all I would like to say thanks to Bob Devine KC6AWX, who was my QSL manager, for all his help and support in the way he wrote out and helped me with my MRCs. Bob is a true amateur and a fine gentleman, and his support when I was so ill was a breath of fresh air; as we say here, 'Goodonya' mate. Bob is also the ARRL QSL manager for the 6 area in the USA.

As I have indicated, my shack wall has many awards posted, and I have many, many more in folders. I have always liked to take on a challenge if it was placed in front of me, and county hunting just looked like a good challenge to me, and this most impressive award takes pride of place on my shack wall and stands out head and shoulders above the rest.

I should point out at this time, my renewed interest in the fabulous awards of the WIA are in my sights for wall space in the near future. I think the new design of these awards is second to none.

Over the years I have lived in several locations; Ballarat, Warrenheip, just outside Ballarat, Warragul in west Gippsland, and Sebastopol and Dereel south of Ballarat. Both the locations of Warrenheip and Dereel have had large areas of land to put up antennas and towers. At my present location I have two Nally towers, one for HF and the other for VHF and UHF.

My shack is inside the home, and contains a Yaesu FT1000MP and IC735 for HF, and a Kenwood TR751A all mode VHF, Icom IC-281H FM, five Philips FM900s and several handhelds for both VHF and UHF.

My HF antennas are a Werner Wulf HB35C and dipoles for 160, 80, 40, 30, 17 and 12. The tower for VHF and UHF has verticals for both bands, as well as a bay of four beams on UHF, and four 11 element beams on VHF to go up, as well as another 11 element beam for repeater use. I also have a vertical for UHF CB for the fire watch during summer as most of the farmers in the district use this band.

My shack has a wrap around console to hold my radios and computer, along with controls for rotators, power supplies and all the odds and ends one thinks may come in handy in the shack. I can walk around behind the console to work on coax and power. I also have an earthing system along the back of the console.

In finishing I must say, as I have done for the past twenty-five years, 'Amateur Radio is like a big bowl of fruit', with so much to choose from, you will never get sick of one thing. And the friendships that are forged throughout the years make your life much richer. 73.

ar

Book Of The Month

The ARRL Handbook for Radio Communications

THE standard in applied electronics and communications

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The ARRL Handbook on CD-ROM version 12.0 included with every book.

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The 2008 ARRL Handbook for Radio Communications uniquely serves both amateur experimenters and industry practitioners, emphasizing connections between basic theory and application. This 85th edition is both a useful introduction to radio communication and a source for answers to questions about every aspect of the state-of-the-art. Topics include Amateur Radio licensing requirements (USA) and operating activities, fundamental and advanced electronics and communications concepts, radio propagation and antenna theory, practical projects, repair techniques, references and much more.

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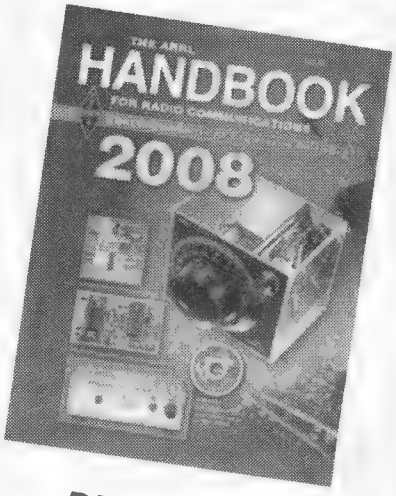

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Peter Hughes VK6HU honoured on JOTA weekend

Bob Bristow VK6POP

Peter Hughes VK6HU became a Scout in Cunderdin, Western Australia, in 1939, 9 years before I was born. He has been a Scout continuously since, in a large variety of roles at local, state and national levels.

On the Saturday evening of the JOTA-JOTI weekend, Peter's family, scouting colleagues and friends gathered at the Western Australian Scout Communication Centre in East Cannington in Perth's south eastern suburbs, to recognize Peter's contribution to Amateur Radio in Scouting.

Peter was the WA JOTA Coordinator from 1969 to 1985, and JOTA Coordinator for Scouts Australia from 1985 to 1996, and is still a member of the WA Scout Communications and Technology Team.

In recognition of Peter's contribution to Amateur Radio in Scouting, the Chief Commissioner of Western Australia, Mrs Susan Mitchell, renamed the centre the 'Peter Hughes Scout Communication Centre' at a short ceremony after an informal barbecue dinner.

Peter said he felt honoured at receiving this recognition from his peers.

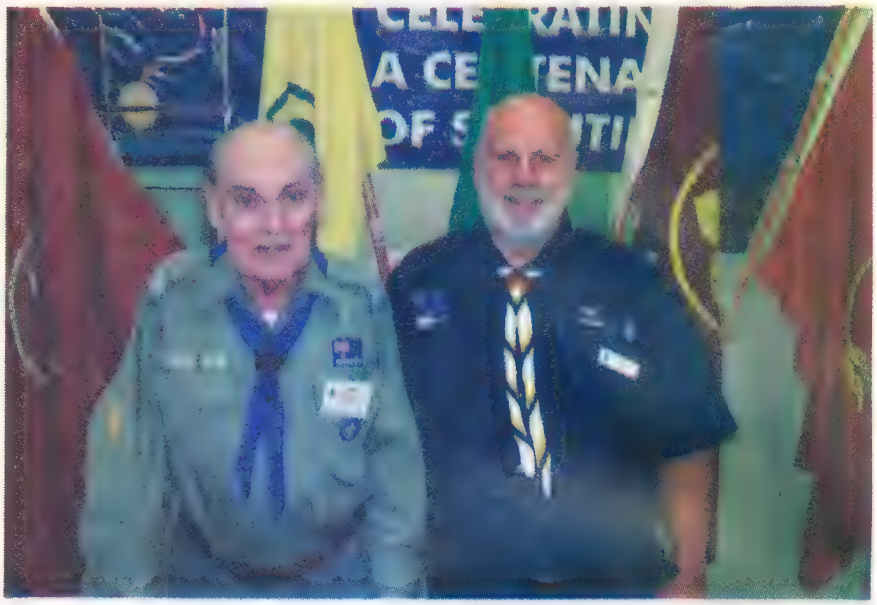

Photo 1: Peter Hughes VK6HU and Bob Bristow VK6POP.

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ARISS presentation to Salt Creek Primary School

Tony Hutchison VK5ZAI

Last month the tiny school at Salt Creek on the Coorong of South Australia received a certificate from ARISS Australia, presented to them by the National ARISS Coordinator, Tony VK5ZAI. The certificate was to commemorate their live link-up with astronaut Suni Williams on the International Space Station and was accepted by Principal Luke Remfry and all twenty two students at the school.

Luke said he would like to express his utmost support for the ARISS (Amateur Radio on the International Space Station) program that has enabled the students to experience a once in a life time opportunity and talk in real-time to an astronaut aboard the International space Station. The certificate will hang on the wall as a constant reminder of the special occasion that took place back in April 2007.

The certificate was designed by Shane VK4KHZ, and has the ARISS logo patch at the top with the ISS expedition 14 and Shuttle flight STS-118 patches beneath. Below this is listed the names of all the students that took part and the others who helped make the linkup such a success.

ARISS is a program made available at no expense to schools and youth groups world wide for the purpose of stimulating the minds of young people in the fields of amateur radio, science and technology. The program is sponsored by NASA, the ARRL and the AMSAT Corporation and is managed by a dedicated group of Amateur Radio volunteers. Enquiries about the program should be directed to vk5zai@amsat.org.

ar

Centre Victoria RadioFest

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The biggest event of its type in Victoria and the only one supported by all the major commercial traders.

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- Come n' try activity
- Scout Radio display
- Club Corner
- Australian Ladies Radio Amateur Association
- Historical radios for sale by tender
- Information about how to become a radio amateur

D-STAR DIGITAL

Second-hand market place and car-boot sales alley. To book tables or spaces contact Nick Angelo VK3UCK Email: vk3uck@hotmail.com phone 0448 653 201.
Also see the website radiofest.amateurradio.com.au for an application form and conditions.
Catering: Hot and cold food and drinks catered by the Kyneton CFA Auxiliary. Hot breakfast available before the gates open. Free tea and coffee available all day. Or bring your own lunch to enjoy in picnic style. Free children's face painting and playground.
Entry tickets $10: Go on sale at 9am with gates opening at 10am. Free entry to children aged 12 and under. No pets or alcohol.

Door prizes: Entry tickets go into the draw for a D-STAR radio and other prizes - conditions apply.
Venue: Kyneton Racecourse, Campaspe Place (off Beauchamp St), Kyneton. Only 50 minutes from Melbourne and an hour from Ballarat and Bendigo. Plenty of free parking.
Info and talk-in: Mt Macedon 2m repeater VK3RMM 147.250MHz from 7.30am to 10.30am on the day.
Email: radiofest@amateurradio.com.au
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Don't miss this major event and great social occasion for everyone with an interest in radio communications.

SmartAds 9802 5926

A Class-E CW transmitter for 1.8 MHz with VFO and QSK

Drew Diamond VK3XU

From correspondence received, it appears that the class-E AM/CW transmitter (Reference 1) has aroused considerable interest. One valid criticism, however, is that only crystal control was provided. 160 m can get rather busy at night, and crystals (other than 1.8432 MHz) are rare and/or expensive, so a VFO would be a great advantage.

Furthermore, on CW, it is much better operationally if the user can listen on the frequency between words and characters - as they are sent - by using solid-state break-in, or 'QSK'.

Offered here, based largely on the previous effort, is a dedicated CW transmitter pattern that addresses the above-mentioned shortcomings, that may be built simply as described here, or parts of it 'grafted' on to the original AM/CW model.

Output power is adjustable between 0 and 25 W (nominally) into 50 ohms. Harmonics are measured at greater than 50 dB below fundamental. Frequency range is from 1.800 to about 1.875 MHz. The robust class-E power amplifier can withstand extreme load mismatch (including accidental short or open-circuit load) for reasonable periods without damage.

Photo 1: The Class-E CW transmitter for 1.8 MHz.

Circuit

So that the VFO may run continuously, and thus avoid any warm-up drift between 'overs', the oscillator operates at twice the output frequency, 3.600 to 3.750 MHz. Hence, the VFO signal cannot be heard on the operating frequency during receive periods.

Output from the 2N5484 VFO buffer (Figure 1) is applied to the clock input pin 3 of a 4013 J-K flip-flop chip, wired to divide by 2. The diode clamp moves the 6 V p-p sine signal (from the buffer) fully into the positive region, thus driving the 4013 without need of a Schmitt trigger. The divider must wait for a low at the (S)et input, pin 6, in order to output a 1.8 MHz square-wave at pin 1.

An NE555 timer chip performs the transmit/receive (T/R) timing function. On key closure, the low presented to the (T)rig input, pin 2 of the '555 causes a high to output at pin 3, which is applied to the base of a 2N2222 (to invert the high, to low, required to enable the divider) at pin 6 of the 4013. The same high from the '555 is also applied to the base of a 2N2222 in the T/R circuit, thus turning off the second 2N2222, which disconnects (turns off) the two routing diodes, thereby effectively isolating the receiver's input from the transmitted signal and the antenna.

Key activity is also applied to the base of a 2N3638 keying transistor. When base current flows via key closure to ground, +6 V is supplied to the PA bias pot (which also functions as a power output control) and the 74HC04 driver chip, five gates of which are paralleled to supply sufficient drive to the gate of the PA MOSFET. A 220 nF capacitor between base and collector of the '3638 provides a nicely shaped ramp of about 3 ms rise and 10 ms fall, for crisp, click-free keying.

Immediately keying (sending) stops, and between words and some characters, the '555 timer will 'time-out' (determined by the 1 M resistor and 470 nF capacitor), whereupon the T/R will re-connect the antenna to the receiver's input.

The class-E PA and low-pass filter (Reference 5) are identical to that used in the AM/CW transmitter of Reference 1. Efficiency for the prototype is 93%, where 30 V DC @ 0.9 A produces 25 W RF output. The curious are pointed to References 1 to 4 for a description of class-E operation.

Construction

The home-made aluminium chassis/cabinet pictured in Photo 1 measures 70 x 265 x 225 mm HWD. The bottom chassis panel functions as a heat-sink for the BUZ90A PA MOSFET (very little waste heat is generated).

The power supply, VFO, and driver/PA T/R are each accommodated upon 'paddyboard' (Reference 6) circuit boards. Suggested layouts are shown in Figure 2. However, any preferred construction style will serve, provided that signal carrying component leads (e.g. coupling and by-pass capacitors, etc) are reasonably short, and the general plan illustrated in Photo 3 is followed.

A rectangular hole, 12 x 18 mm, should be provided in the RF board so that the

continued on page 26

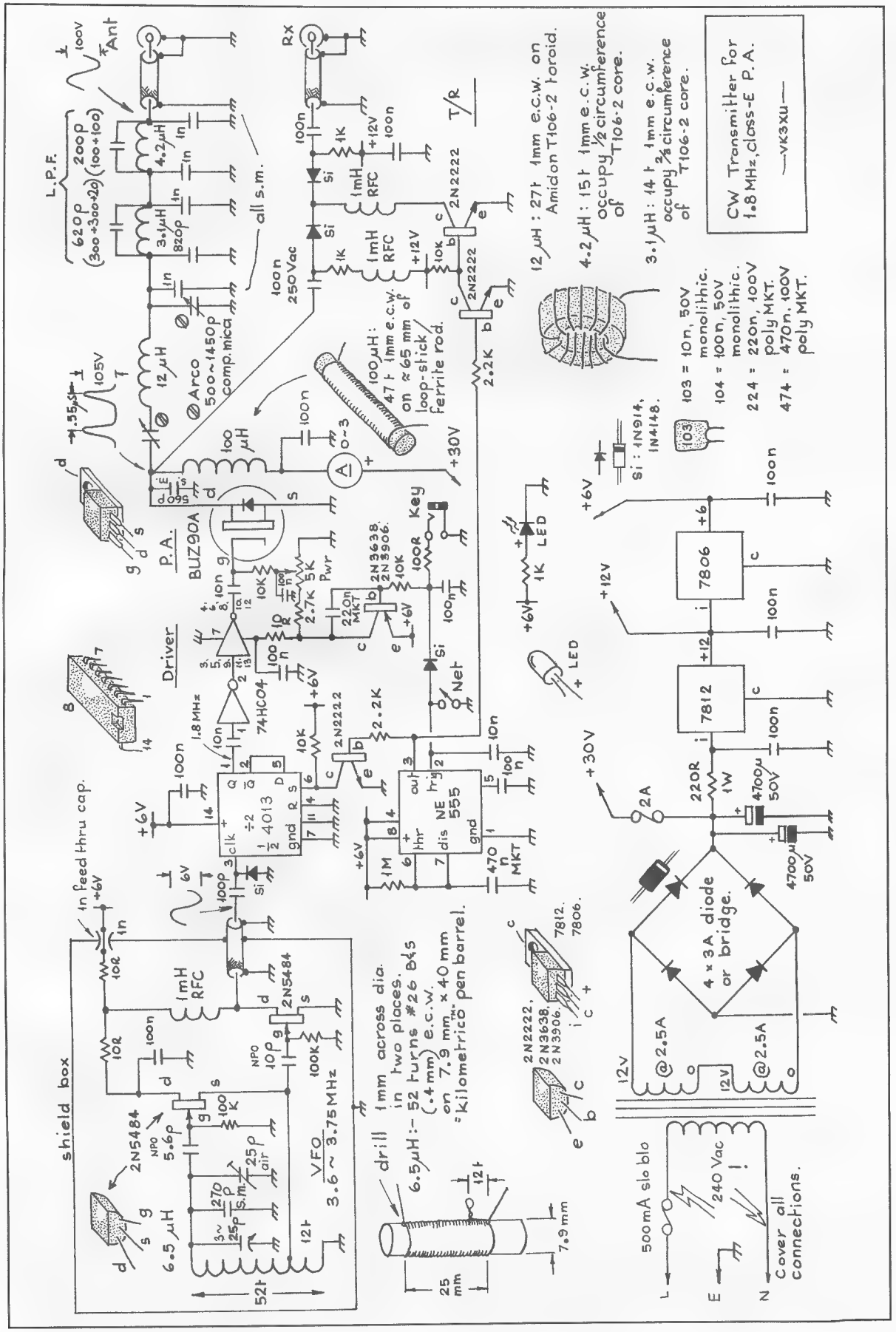

Figure 1: Circuit diagram of the Class-E CW transmitter for 1.8 MHz.

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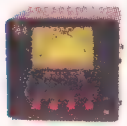

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QST found that the Palstar WM150 is the only wattmeter that has true Active Peak Reading. The PM2000A is the next generation of watt meters from Palstar.

PALSTAR ZM30 Antenna Analyzer

The Zm30 is an automated micro-controlled SWR antenna analyzer with a 8 bit micro-controller with a precision low power DDS signal generator. It also includes a self-calibrating reflectometer and displays SWR at selectable frequencies from 1 Mhz to 30 Mhz. It measures: SWR, impedance, reactance, inductors and capacitors, transmission lines, stubs, Q, and resonant frequency. There is a serial port for field upgradable software. Battery operated. As on all Palstar products the front panel is powdercoated.

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Mean Well PB 360P-12 battery charger

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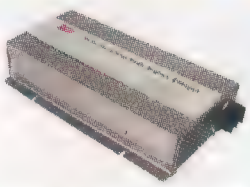

From one of the world's leading switching power supply manufacturers comes this charger, one of more than 2000 various pieces of Mean Well equipment that facilitate power world-wide to the medical, communicatons, military and automation sectors. In the TTS philosophy of reliable quality for less, we offer this state of the art battery charger. 14.4 V 24.3 A, 3 stage charging, simple switch between 90-132VAC and 180-264VAC, remote on/off, fan cooled, many protections.

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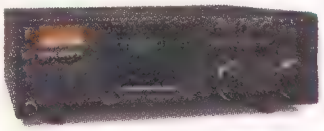
Orion II



First independent test data on ORION II, released 16 April 2006: "Noted receiver guru Rob Sherwood NC0B of Sherwood Engineering now ranks the **ORION II as #1 of all HF amateur radio transceivers ever tested** for close-in dynamic range, dating back to the 1970's. The original ORION is now listed as #2 overall to the ORION II ".

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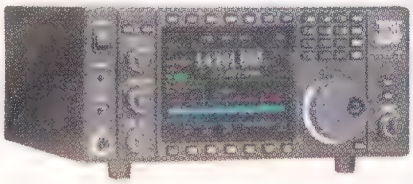

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"The rig is complete without the need to buy any options or accessories. The rig is not "quirky". Everything works as advertised and as one would expect Although it is firmware-defined, this is not a menu-driven rig. It feels as though I'm operating a ham radio, not interacting with a computer". (WB5GWB on e-ham)

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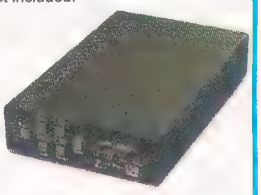
AT200Pro

• 5 to 250 watts SSB and CW. (100 watts on 6M) • Easy to read LED bargraph • 16,000 3D memories • **Two** position antenna switch with memories for **four** antennas on **each** position. • Frequency coverage: 1.8 to 54.0 MHz. • Optional interfaces for Icom and Yaesu available

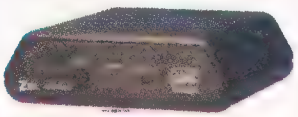
The **LDG AT-897** Autotuner mounts on the side of your FT-897 just like original equipment. The tuner's front panel button will initiate the tuning sequence or allow tuner bypass. The AT-897 powers from the CAT port of the FT-897 and has a CAT port on the back. The AT-897 needs no fan so is battery friendly, with usage in the micro-amp range, you can remove power from the tuner after you have tuning Two year limited mfg. warranty. *FT-897 shown in photos, not included.*

Z-11Pro — Legendary Portable



0.1 to 125 watt power range (SSB and CW), 100W on 6M. Easy to read LED display 8000 3-D memories. Tuning time: 0.1 to 6 seconds full tune, 0.1 seconds memory tune. 1.8 to 54.0 MHz coverage. Tunes 6 to 1000 ohm loads For Dipoles, Verticals, Vs, Beams or and Coax Fed Antenna. Optional tuning of random length, long wire or ladder line fed antennas. Optional interfaces for Icom and Yaesu available.

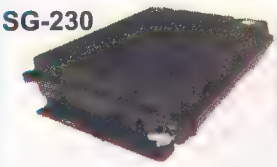
Z-100 — Low cost tuner



• Microprocessor control • High efficiency switched "L" tuning • LED indicators. • 200 fast memories • holds tune position forever. • low power consumption • Tuning time: 0.5 to 6 seconds, 3.0 average • Current consumption: Idle - Nearly zero amps, Tuning - 300 mA max • Voltage requirements: 11 to 18 volts (user is power source) • 1.8 to 54.0 MHz coverage.

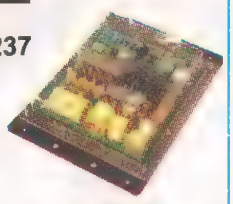
SGC

SG-230



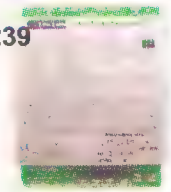
The SG-230 Smartuner senses RF when you transmit and automatically finds the best SWR match to your antenna. Works with ANY radio and ANY antenna and requires NO special interface — the most versatile tuning product available. Can be used in base station, mobile, marine and aviation applications. Sealed case — rugged.

SG-237



The SG-237 Smartuner has high density surface mount components on a 4 layer PCB, for high efficiency, reliability and performance, all mounted on a sturdy chassis plate for excellent electrical and RF ground system resuts, fully waterproof (2 ft of water for 24 hours). Weather resistant, high grade ABS plastic case sealed at the factory.

SG-239



Quality low cost package. The SG-239 will operate from 1.8 to 30MHz with 1.5 to 200W. It has over 130,000 possible tuning combinations and 170 memory bins for fast, accurate tuning. Like all Smartuners, it gives you the most flexibility because it will work with any antenna and any transceiver. It also has push buttons for a manual tune option. Only weighs a kilo.

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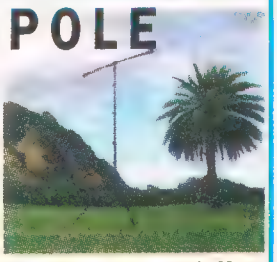

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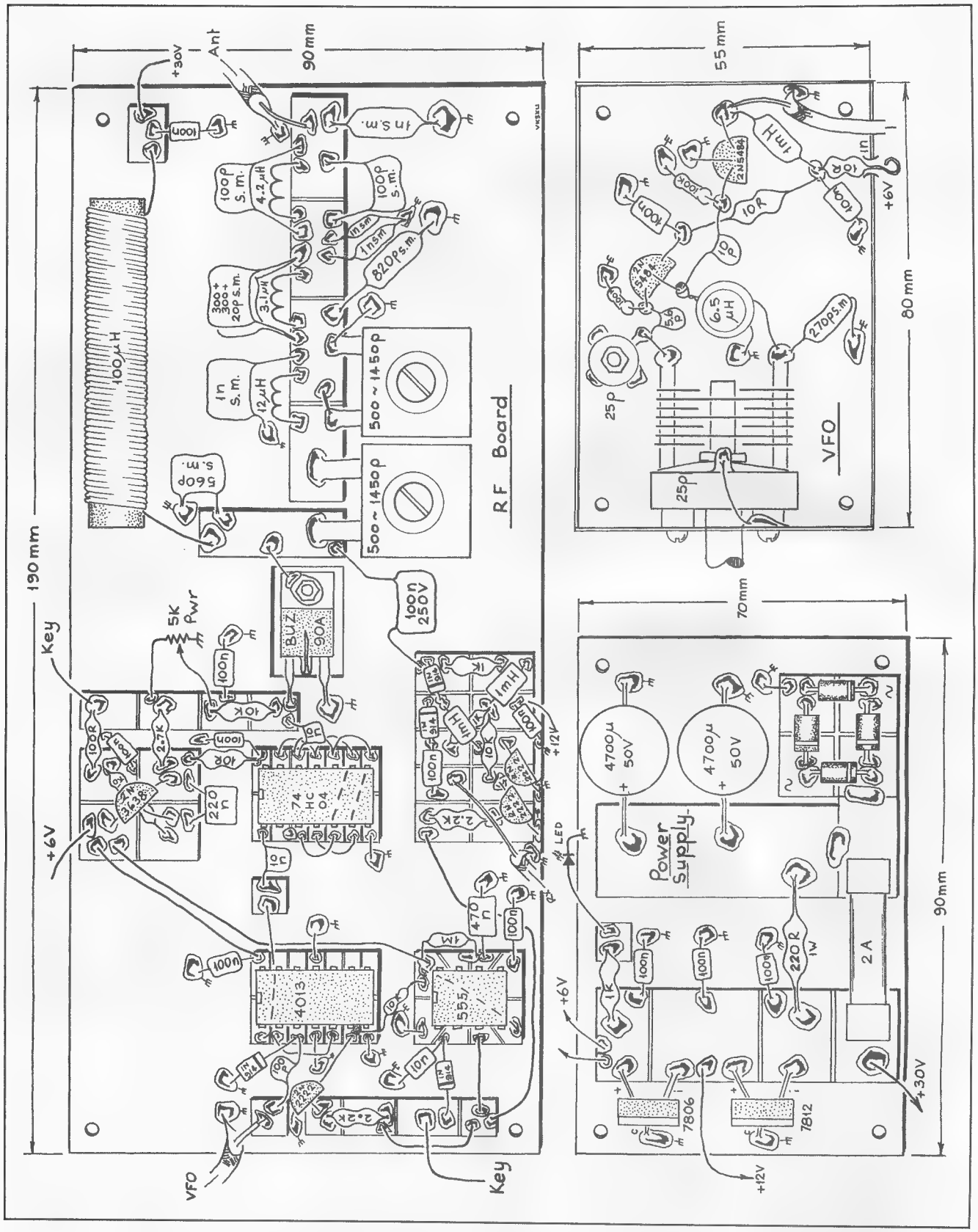

Figure 2: Suggested layout of 'paddyboards' and components for the Class-E CW transmitter.

BUZ90A may be attached directly to the bottom panel. Include a silicone washer and the usual hardware. A solder tag is mounted under the 3 mm hex fixing nut for the drain connection.

The 4013 and 74HC04 chips may be fitted into appropriate IC sockets, which in turn are soldered to suitably sized pieces of Vero board. Remember first to cut a shallow slot (junior hack-saw) along their length to separate the pins each side of the Vero 'substrate'. Avoid poking the socket pins right through (so as not to short to the board foil). These are super-glued (sparingly - no glue on items that must take solder) upon the RF circuit board as shown.

The drain choke coil is 47 turns of 1 mm (#18 B&S) ecw wound upon a 65 mm (approx) length of ordinary 9 mm diameter ferrite rod/loop-stick material. The start and finish of the winding may be secured with a cable-tie fitted over the coil at each end.

The two compression mica trim capacitors will need suitably sized holes in the RF board, and corresponding holes in the bottom panel (which allows, if desired, adjustment of these with the top cover fitted).

VFO and buffer should be accommodated in an RF tight box measuring 50 x 55 x 80 mm HWD made from soldered-together single-sided circuit board, as pictured in Photo 3. A 3 mm brass nut may be soldered into each corner for affixing the lid. Brass or bronze shim metal 'fingers' should be soldered to the box walls in four places to ensure reliable electrical contact with the lid.

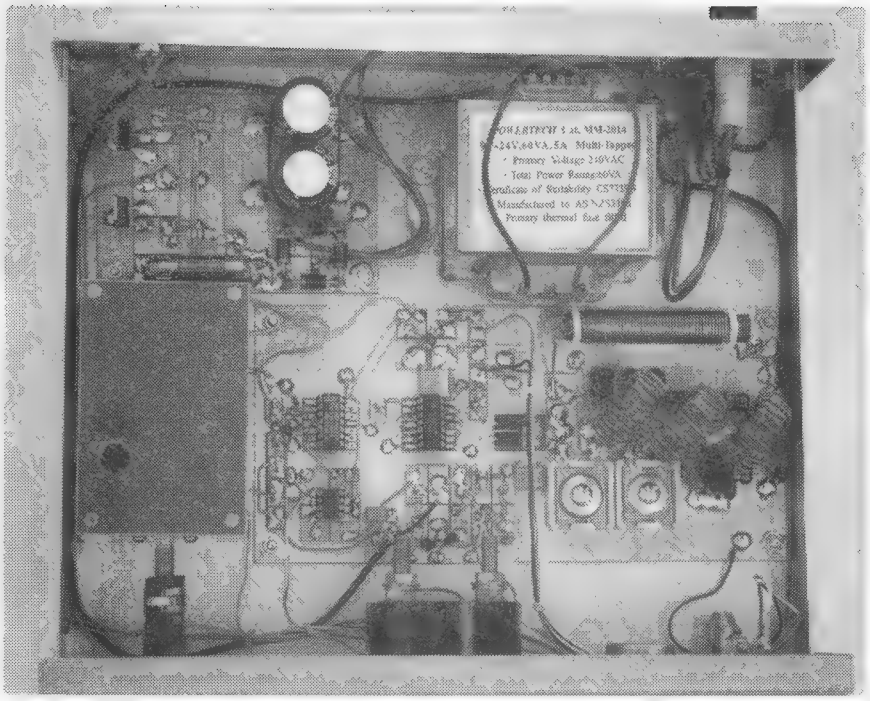

Photo 2: Internal view of the Class-E CW transmitter.

The variable capacitor may be any well-made part with a range about 3 - 25 pF (see Parts below). Ordinary 'ugly' construction is quite suited to oscillator work and, provided that lead lengths are short and components are mounted rigidly, your oscillator should be remarkably stable.

The VFO coil is 52 turns of 0.4 mm ecw wound tightly upon a 40 mm length of common 7.9 mm diameter 'Kilometrico' pen barrel. This material is easy to work and has been found, in numerous examples, to provide good mechanical stability, and low loss for oscillator coil applications. Drill a 1 mm hole across the former's diameter, as shown in Figure 1. The source tap (a twisted 'pig-tail') is at 12 turns from the 'earthy' end. The coil may be fixed to the VFO board with a blob of hot-melt glue.

continued on page 30

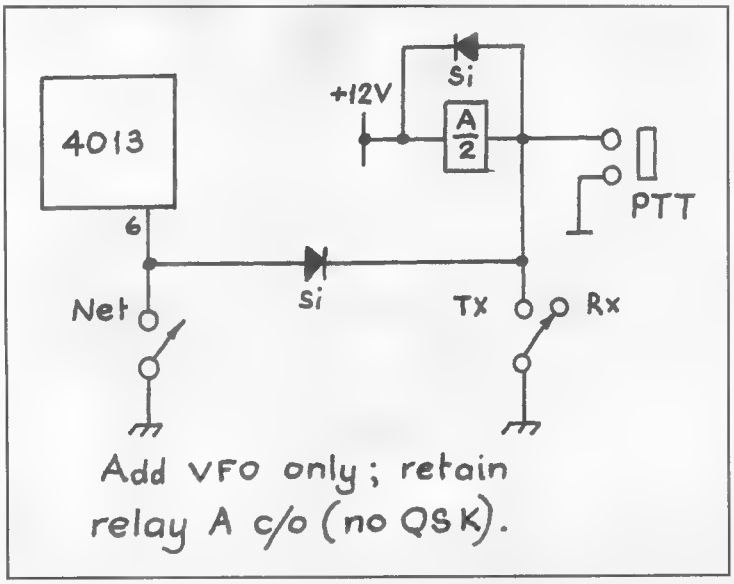

Figure 3: (see text).

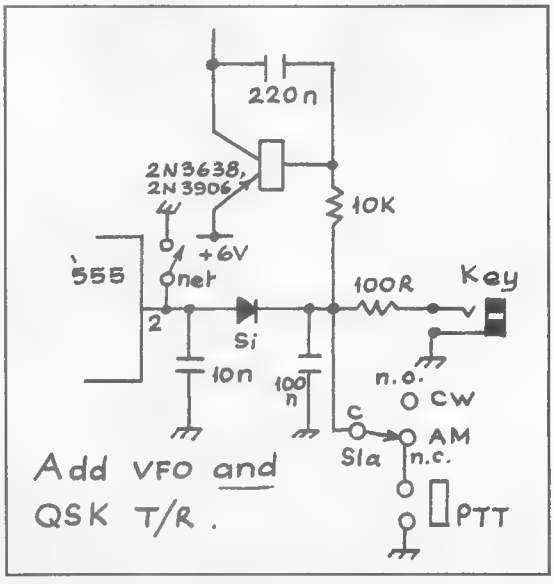

Figure 4: (see text).

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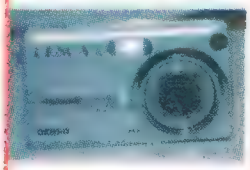

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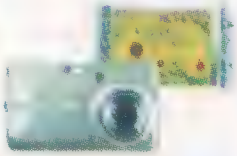

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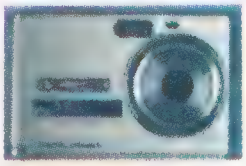

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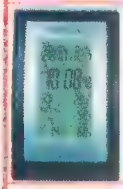

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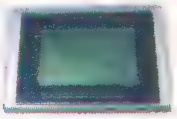

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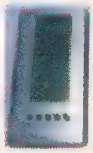

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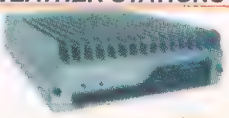

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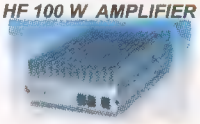

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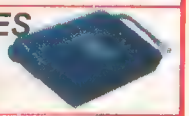

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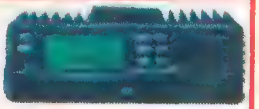

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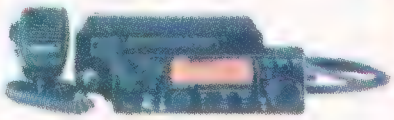

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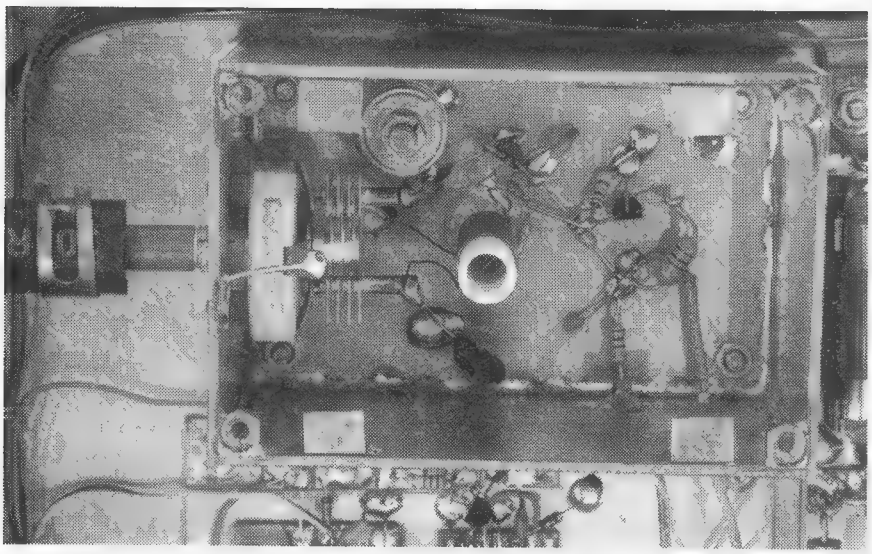

Photo 3 : The VFO assembly.

All wiring on the 240 V AC mains side of transformer MUST be suitably covered to prevent accidental contact. Include a 500 mA 'slow-blow' fuse in the line side.

Modifying the Original Model

Figure 3 illustrates how the original model (Reference 1) may be modified to allow the VFO to be added (but retaining the ordinary relay A change-over), and Figure 4 shows the changes needed when VFO and QSK are fitted.

Operation

Carefully inspect your wiring and soldering for quality, accuracy, and absence of solder 'bridges' (between Vero tracks). Double check for correct polarity of all polarised devices: ICs, electros, diodes, regulators, transistors, FETs, etc.

It would be prudent to first verify the supply rails. Remove the 2 A PA fuse from the power supply board. Apply mains power and check that you have (about) +33 (no load), +12 and +6 V DC where indicated.

If an oscilloscope is available, close the key and observe the signal at the gate of the BUZ90A. You should see a (perhaps raggedy) square-wave of about 6 V p-p. Some salient signal wave-forms are shown on the circuit to aid in any necessary trouble-shooting.

With the VFO cover in place, adjust the 25 pF trimmer so that 1.801 MHz is generated with the variable cap at full mesh, and about 1.875 MHz at the high end.

Replace the 2 A fuse. Connect a suitably rated 50 ohm dummy load/ power meter to the output. Also hook your X10 oscilloscope probe to the output connector. Set the 5 k 'Pwr' potentiometer to about half travel. Close the key, whereupon drain current (ID) should rise, and some power output should be indicated. Turn the Pwr potentiometer fully clockwise, then adjust the series tuning and load compression capacitors for maximum indicated output which should be 25 to 30 W. If you want maximum efficiency, increase the capacity of the series tuning capacitor for about 0.9 A drain current, or about 25 W output.

With the 'scope time-base at (say) 0.2 µs/division, observe a clean sine-wave output signal. Connect a 50 ohm termination to the RX connector. With the 'scope at greatest sensitivity (say 5 mV/div), check that the T/R circuitry is working, in that little or no signal is present at the RX connector.

Verify CW keying by setting the 'scope for ~10 ms/div and observing a nicely ramped keyed wave-shape, free of blips or spikes (you may notice a smidgen of 100 Hz ripple, which is quite acceptable).

Parts

All of the ordinary components are available from our usual electronics suppliers, including Altronics, Electronic World and Jaycar. The mains transformer should have a secondary of 24 or 25 V AC @ 2 or 2.5 A, such as a Jaycar M 2014 (generic 2167L).

Capacitors marked '10 n' and '100 n' and are 50 V monolithic types. The capacitor between the PA drain and the T/R circuitry should be a 100 nF, 250 V AC polypropylene.

My Arco 500-1450 pF compression trimmers, P/N CTM-309, were mail-ordered from Surplus Sales of Nebraska (www.surplussales.com). For best efficiency and stability, fixed capacitors marked 's.m.' should be 500 V silver mica types. These may be ordered from Antique Electronic Supply (www.tubesandmore.com).

Siemens BUZ90A MOSFETs (P/N is 12329) may be purchased from Rockby Electronics (www.rockby.com.au).

The three Amidon T106-2 toroids may be ordered from any of the suppliers regularly listed in the Hamads of *Amateur Radio* magazine.

As mentioned, the 3 – 25 pF variable capacitor for the VFO must be first-class. An English Jackson Bros or 'Polar' would be ideal. The trim capacitor should be an air dielectric type, such as a 25 or 30 pF Philips 'beehive' (please contact the writer by 'phone [03 9722 1620] or letter if you cannot locate a suitable variable capacitor).

References and Further Reading

1. "An AM/CW Transmitter for 1.8 MHz with Class-E P.A."; *Amateur Radio*, June 2007.
2. "Class-E RF Power Amplifiers"; N Sokal, WA1HQC, *QEX*, Jan/Feb 2001.
3. Experimental Methods in RF Design; W Hayward et al.; *ARRL*, pp 2.31, 2.32.
4. "High Efficiency Class-E Power Amplifiers"; D Rutledge et al.; *QST*, May-June 1997.
5. "Low-pass filters for solid-state linear amplifiers"; K Shubert, WA0JYK, *Ham Radio*, March 1974.
6. "'Paddyboard' Circuit Construction - Revised"; *Amateur Radio*, May 2005.

Photos: Karlen Dockrey

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Spotlight on SWLing

Robin Harwood VK7RH

2007 has been a mixed bag. More international broadcasters have abandoned shortwave for either streaming on the Internet, establishing FM relays within metropolitan regions or ceasing HF altogether.

Now VOA is going to close their Morocco relay site at Briech at the end of March. It is unclear whether Morocco will take over the senders but the IBB, the parent organisation of the VOA, has indicated that the site will be completely vacated by next December. It was rather ironic as the 2008 edition of Passport to World Band Radio had a section on the former international zone of Tangier, which was returned to Morocco in 1959.

The Moroccan relay is heavily used by the IBB to broadcast into the Middle East and the former Soviet Union and the announcement stated that there would be no reduction in programming as other sites would take over.

Felix VK4FUQ wrote me and said:

Many thanks for your ongoing "Spotlight on SWLing" column in AR magazine. I have to admit that general shortwave listening and I go back a very long way and despite the march of technology. I still find something wonderful about having a good (and working) communications receiver. These days, along with my Yaesu FT 900 transceiver, which has an excellent general coverage receiver – I also possess a second hand, but mint condition Yaesu FRG-100 communications receiver which is excellent in just about every way. When I am in the shack it is the receiver that I use for general short-wave listening. I also own one of the DEGEN DE- 1103 'World Band' portables. It is one hell of a receiver! Such amazing receiving performance for such a small package. Just perfect for portable use.

Now being in my mid 40's, I still remember the glory days of short-wave long before the internet was even thought of! It is nice to know that at least some of the international short wave broadcasters of those days are still around, but sadly many have left the short-wave bands forever. I still have fond memories of the musical signature tune broadcast by Swiss Radio Internaternational before all their short-wave transmissions, a distinctive sound sadly no longer heard on the short-wave bands. I remember back to the early 1970s when Radio Australia had a very extensive short-wave service with target areas into Europe, North America and elsewhere around this planet and not just geared towards the general Asia/ Pacific area as it is today.

Curiously enough there are still some similarities with programming of the early 1970s. In those days their morning program in the English language was called 'A Brighter Day', if I remember correctly. Today they have 'The Breakfast Club'. Technology has certainly radically changed from the early 1970s but having said that, to my ears anyway the general programming seems vaguely familiar in general terms. I was quite pleasantly surprised to hear a week or so ago, one Saturday afternoon a program that I last heard as a adolescent back in the late 1970s. It was the 'DX Partyline' program broadcast on HCJB Australia. Their evening transmission on 11.750 MHz is always very strong here into northern Queensland.. Does anyone remember the 'DXer's Calling' program broadcast on Radio Australia many years ago? I remember reverently listening to it, as all the times and frequencies were read out.

I guess technology must evolve but I hope that we never quite lose good old fashioned short-wave broadcasting in 'Amplitude Modulation'. Even to a Hi Fi addict like me the sound of AM on the short-wave bands is still quite enthralling, but then again I am a fan of vinyl records too. Just call me a traditionalist! – Felix VK4FUQ in Ingham, Queensland.

His email evoked memories of that very distinctive music box interval signal from Switzerland and that Swiss chronometer and the Swiss music which came towards the end of the English segment. Sadly those days are gone. I recently read how standards gradually slipped from when the BBC newsroom announcers had Oxbridge accents. Some of today's accents are difficult to follow.

Just when one thought shortwave broadcasting had died, political turmoil in Pakistan resulted in a military coup with all independent media closed. Naturally this led to a huge demand from electronic stores for portable shortwave receivers as people were hesitant about purchasing satellite dishes for television. Broadcasters increased their programming in Urdu and other languages spoken in Pakistan to cater for the demand for news and information.

A few weeks prior to the Pakistan crisis, Myanmar, (Burma), also erupted in unrest. This led to an increased output in broadcasts from international broadcasters and also from the clandestine Democratic Voice of Burma, based in Norway. Myanmar is often heard on 5770 around 1200 UTC. The clandestine station naturally has an irregular schedule but has been reported in the 16 metre band.

I recently heard an unusual station on 7540 at 2030. It broadcast distinctive Middle Eastern music continuously with few announcements. I could not identify the language at first but just before they signed off at 2057, It identified as "Denge Mestotamya". PWBR and other online sources confirmed this as a Kurdish clandestine station operated by the PKK. This terrorist group has been for some time trying to form an independent Kurdish homeland around south-eastern Turkey, north-western Iran and north-eastern Syria. Recent terrorist incursions intoTurkey saw that nation threaten to enter the autonomous Kurdish region of Iraq to destroy the PKK bases. This threatened the regional stability in an extremely volatile region.

Denge Mestotamya apparently broadcasts from Moldova, which is next to Romania, from a 500 kW sender, which explains why the signal is so strong in this region. I can also hear it in our local evening at 1230 on 11530 with identical programming to that heard later on 7540.

Incidentally the VOA also broadcasts in Kurdish on 7475 from 1900 to 2000 from Sri Lanka.

That is all for this month and this year. All that remains is to wish you Seasons Greetings and hope that the Sunspots will increase next year. Currently they say there are no sunspots at all!

73 de VK7RH **ar**

Five Examples of Having Fun with D-

Have you ever thought how you could access the Internet via amateur radio?
What would it be like to hear crystal clear communication via handheld or mobile city to city, country to country?
Would you like to send SMS, type with Bonsai Q, track position data, find your friends or check their progress on UI-View®?
Maybe you are part of WiCEN, reaching to integrate voice and data mobile real time. Send voice, files and pictures

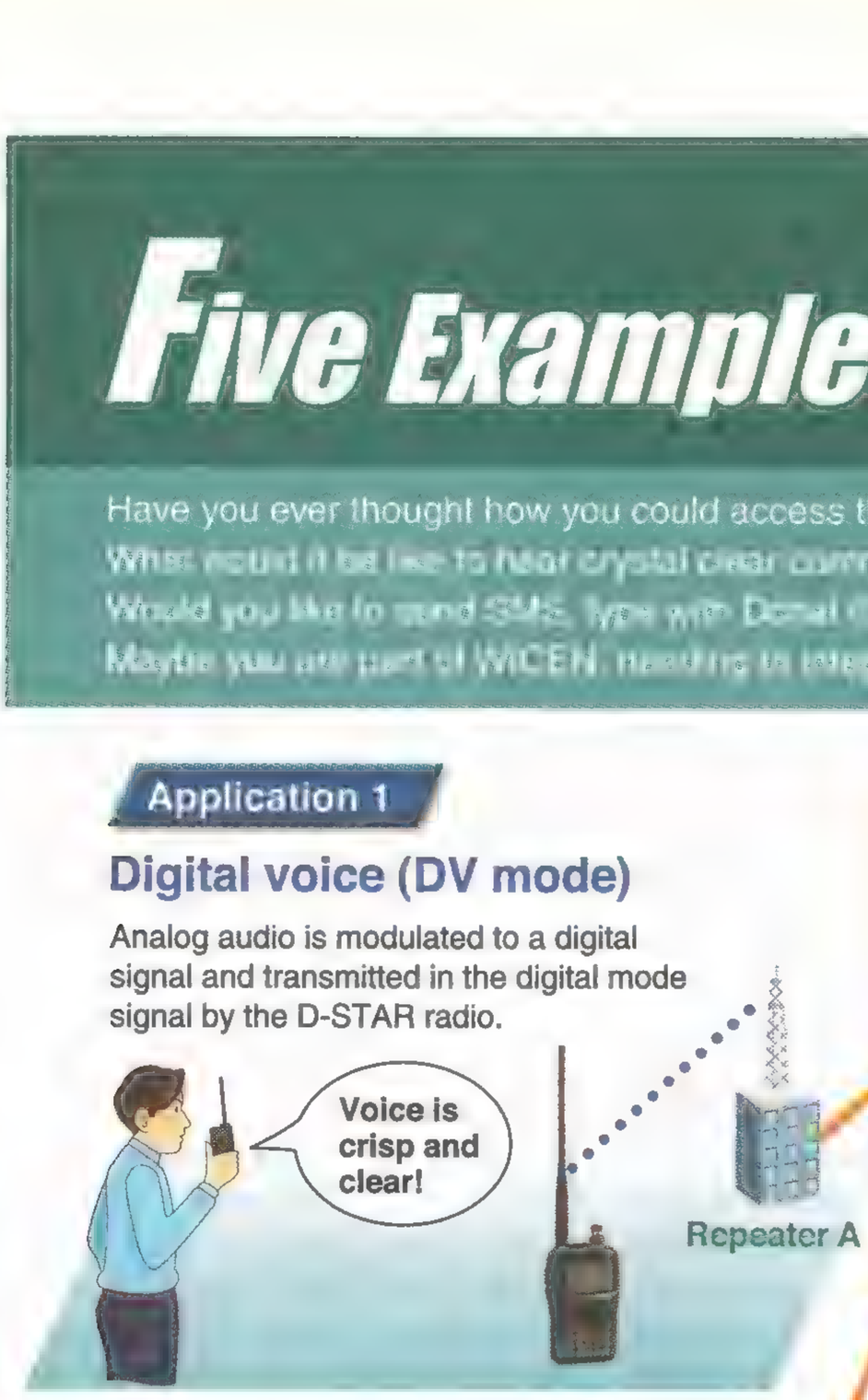
Internet connection*

The Internet gateway allows linking of D-STAR repeater sites over the Internet. You can uplink to your local repeater and downlink from a remote repeater, even from a foreign country!

Application 1

Digital voice (DV mode)

Analog audio is modulated to a digital signal and transmitted in the digital mode signal by the D-STAR radio.



Application 2

Short data message (DV mode)

Call sign identification and short data messages are available.

Application 3

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With a GPS receiver connected, you can send your current position, and receive, process and display position data from the received station. (IC-2820H**) Beacon to the DPRS/APRS® Network, and you'll be on the map with "UI-View®.

Internet
DV mode (4.8kbps)
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* Some restrictions may apply depending on specific countries' regulations.
** With optional UT-123 D-STAR PCB and GPS .

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real time at 128Kb/s, Enter D-Star!

Application 5

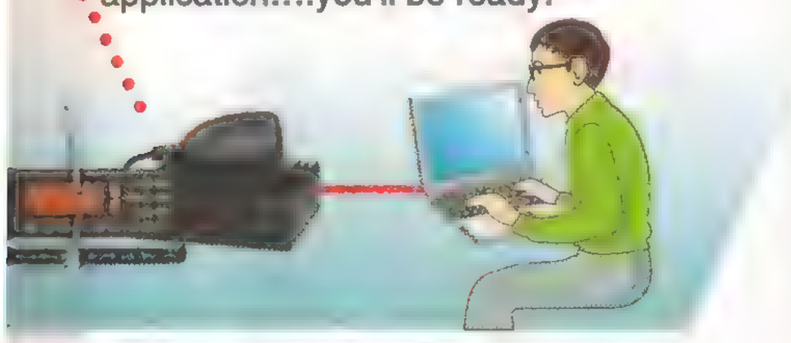
IP camera (DD mode)

You can transmit live images in DD mode and watch real-time images from a remote location.

Application 4

Internet access (DD mode)*

In DD Mode at 128 Kb/s you can access the Internet to other D-Star zones in Australia or anywhere a D-Star system is connected ..even Kazakhstan! Connect a PC to an ID-1 and you can browse D-Star system websites, local info-kiosks, check e-mail, FTP…just about anything. D-Star is open and non-proprietary, just wait for the next application....you'll be ready.



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Frequently Held Myths About D-STAR

GET THE FACTS!

1. "D-STAR only works on 1.2 GHz."

FACT

Low-speed DV D-STAR voice and data works just fine at 144 and 430 MHz. 1.2 GHz supports the bandwidth needs of high speed DD data. Choose the technology that satisfies your needs.

2. "There's no difference between D-STAR and packet"

FACT

Even D-STAR's lowest speed is competitive with the highest-perfromance packet systems available today. D-STAR's simultaneous digital voice and data at 4800 bps is beyond the capability of any packet technology. Hi-speed D-STAR systems are ten times faster than the highest packet speeds.

3. "D-STAR is no different from IRLP or Echolink®"

FACT

VOIP systems like IRLP and Echolink® are only capable of routing voice signals. They don't support data exchange at any speed. Calls targeted to a specific user are not possible by any amateur technology except D-STAR.

4. "D-STAR is just a digital party line!"

FACT

The ability of D-STAR repeaters to route data and digitized voice worldwide sets it apart from a single party line. Sophisticated D-STAR controllers and gateways implement modern telecommunications functions in an amateur package.

5. "D-STAR is a replacement for broadband home Internet"

FACT

Truly a fantasy! D-STAR can connect a user to the internet, true, but all of the amateur radio restrictions on commercial activity still remain in place. D-STAR will provide the tools for a lot of great amateur innovation, but it's not intended to replace Internet providers.

6. "D-STAR won't work with APRS®"

FACT

Except for the ID-1, All D-STAR radios can do DPRS when connected to a GPS receiver. The exciting thing is, with D-STAR being an open protocol, software experimenter, Pete Lovell AE5PL, has written a program that interfaces DPRS to APRS® and sends the converted APRS data to your APRS IS gateway. This means you can see all the new D-STAR stations on UI-View®. With the "D-STARTNC2" application, any D-STAR repeater with a gateway can send DPRS □APRS data to the APRS Internet system. The D-STAR team will be implementing this interface in Australia.

7. "I'll be locked into Icom equipment forever."

FACT

While Icom is the first manufacturer to support D-STAR, any manufacturer or amateur can use the JARL standards to create equipment – transceivers, repeaters, and gateways – compatible with the D-STAR system. As the D-STAR system grows, look for other manufacturers to join the fun.

Cover story

Microwaves 2:

The 23 cm band and transverter topology

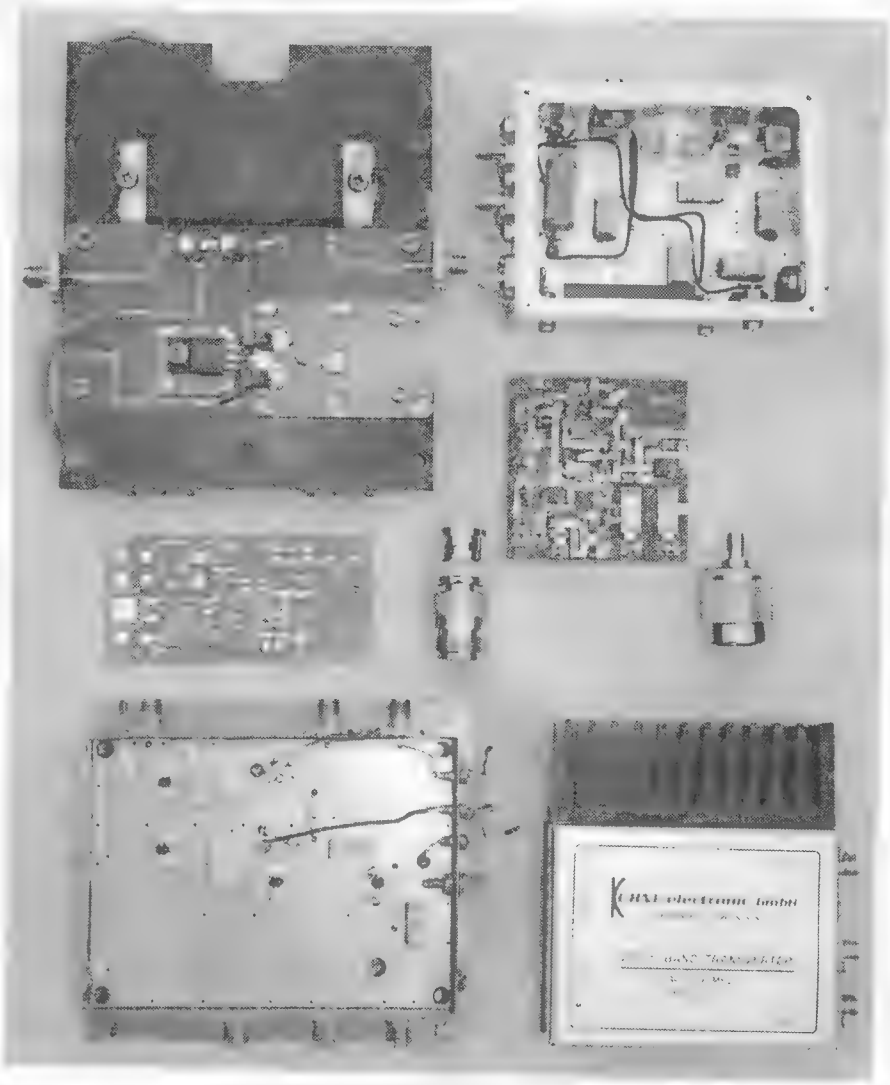
Peter Freeman VK3KAI

23 cm: the first microwave band

Whilst technically classified as UHF, the 23 cm band (1240 – 1300 MHz) is commonly referred to as the first amateur microwave band. This band is allocated to Radiolocation & Radiolocation Satellite as Primary services, with Amateur and Amateur Satellite as Secondary. The key segments to note are the narrow band modes at 1295 – 1297 MHz, with the primary frequency being 1296.1 MHz, amateur satellites in 1260 – 1270 MHz, and FM operations at 1293 – 1295 MHz, with repeater output frequencies located 20 MHz below the input frequency. The band plan shows 2 ATV channels, each wide enough for AM or FM operations.

Over the years, the Japanese equipment manufacturers have produced equipment for this band. The only current models available in Australia offering this band are the TS-2000X from Kenwood and the IC-910H from Icom, if you fit the optional 23 cm module. Both of these radios are multimode, offering FM, CW, SSB and RTTY. Earlier models include the IC-1271, IC1275 and IC-970, the FT-736 (again, with 23 cm as an optional module), and a variety of FM only units, both mobile and handheld. Note that relatively few of these various radios were imported into Australia, so it can be hard to find second-hand units. One area of possible expansion is in digital communications, with Icom offering their D-STAR equipped radios for sale in the US and recently launched in VK. These D-STAR radios allow traditional narrow band FM as well as high speed digital voice and data communications.

As mentioned in the first part of this series, it is feasible to run a tripler from



The key components required for 23 cm, build your own or ready to go.
(Cover photo)
Clockwise from bottom left: A completed Mini-Kits transverter built by VK3KAI, the pcb for a low noise amplifier, a home-brew 15 W amplifier, a completed DB6NT 13G2 transverter kit built by VK3KAI, a local oscillator chain almost ready to tune up, and a complete ready-built DB6NT 13G2 transverter. For size comparison, SMA to N and BNC to N adapters are included either side of the LO board.
Photo by Peter Freeman VK3KAI.

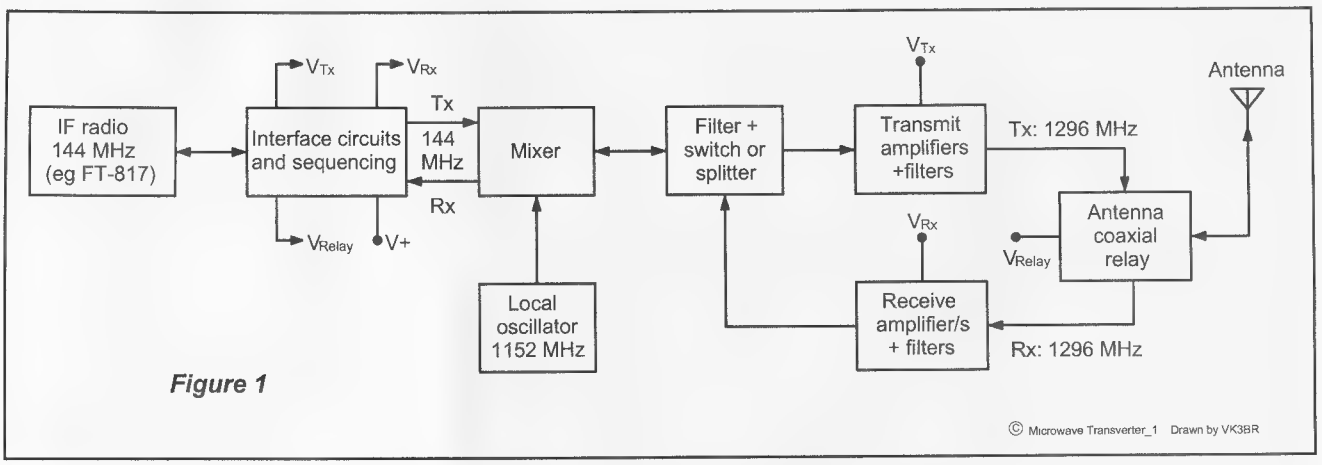


Figure 1: One typical configuration for a microwave band transverter.

the 70 cm band as a transmitter for CW and FM operations. On receive, one could use either a scanner receiver or a receive converter to a lower frequency. To operate on SSB, the options are to purchase a commercially produced radio, such as the TS-2000X or the IC-910H with the 23 cm module, or to build or buy a transverter based system. I will explain the basics of transverter operation shortly.

Before we consider transverters, let us look at antennas. At 1296 MHz, a quarter-wave is only 5.8 cm! This would make for a very inconspicuous antenna (although with not very much gain). A Yagi with a boom of 1.5 m has a gain of approximately 15.5 dBd, for one of the more modern designs such as the DL6WU or DJ9BV series. An antenna with equivalent gain at 144 MHz would be about 14 metres long. A grid-pack style parabolic reflector of 900 mm height, such as the larger units used in various locations for the MMDS Pay TV systems some time ago, would have a gain of approximately 20 dBd with an appropriate feed fitted. Larger parabolic reflectors will have greater gain when appropriately fed.

Of course, we must consider how to connect the radio or transverter to the antenna. Whilst the short wavelength means that higher gain antennas are feasible, feedline losses increase with frequency. The commonly used "low loss" feedline for HF and VHF, RG-8, has 28 dB loss per 100 m! LDF4-50 has 8.7 dB loss per 100 m and LDF5-50 has 4.9 dB loss per 100 m. Clearly, one should use the best cable you can find and/or afford, and aim to keep feeder runs as short as possible. It is important to remember that whilst the feed line loss means less of the transmitter power makes it to the antenna, it also means a significant degradation of receiver system performance – each decibel of loss means an additional decibel increase in noise figure, limiting receive capability in weak signal conditions.

What can one expect from this band? Under typical flat conditions, stations in the Latrobe Valley regularly make contact on SSB with Rob VK3EK in Bairnsdale over a path of approximately 120 km. During Field Day operations, contacts to well beyond 200 km are usual and much greater distances are regularly worked. With the aid of tropospheric ducting, stations in the Sydney region work into New Zealand. The current VK record for the band is across the Great Australian Bight – in excess of 2450 km.

Transverter topology

For most of the microwave bands, the current basic technique is simply an extension of the heterodyne system. The significant difference is the intermediate frequency (IF) that is used. A transceive system using this architecture is commonly referred to as a transverter. For the microwave bands, the most common IF is 144 MHz. The basic topology of a transverter is shown in Figure 1, showing how this works for the 23 cm band.

The IF system is often a complete transceiver in its own right, typically a multimode two metre band transceiver operating at low transmit power settings. An interface unit will enable control of levels and provide sequencing of control voltages.

On transmit, the 144 MHz signal is fed to a mixer together with a local oscillator (LO) signal. In our example system for 23 cm, we mix 144.1 MHz with a LO of 1152 MHz. The main outputs of the mixer will be the sum and difference of the LO and IF frequencies – 1296.1 MHz and 1007.9 MHz. Of course the difference frequency in this example (approx. 1008 MHz) is not a desirable output. Therefore, we need to follow the mixer with an appropriate filter – one that will pass the desired frequency (1296.1 MHz) and reject all others, including the LO signal that may feed through the mixer. Following the filter, we simply amplify the desired signal to required power level using amplifiers suitable for the mode of transmission being used. If we wish to use SSB and other compatible modes, the amplifier will need to be linear (class A or AB), not one running in class C. On receive, the signal from our antenna is fed to a receive preamplifier and filter and then to a mixer. The mixer is also fed with the LO signal and again gives us outputs similar to what we saw in transmit mode – sum and difference of the RF and LO signals to give us the required IF signal (144 MHz) in addition to an undesired image output (2448 MHz). The mixer may be common to both transmit and receive pathways or separate mixers can be used in each.

If we wished to operate only CW or FM, we could use a simpler technique on transmit. We could generate a transmit signal at 432 MHz and apply that signal to the input of a tripler. The output would be 1296 MHz. The tripler will give an output level of about one third of the input signal. We will need to filter the

Photo 1: The G3WDG011 23 cm transverter. (Note this kit is no longer available)
Photo by Charles Suckling G3WDG.

output and possibly amplify the output of the filter. For receive, we would use a similar line up as the receive side of our transverter, but with a LO set to 864 MHz if we wish to receive on the 70 cm band. However, note that we would need to set up the 432 MHz radio correctly, as the frequency translations are different in transmit and receive modes. Another technique that would work is to use a PLL system to control an oscillator at the required RF frequency to generate the CW or FM signal. PLL systems can also be utilised to generate the required LO signal for our transverter, but we must be careful to ensure that signal is sufficiently stable and has low phase noise so as to not degrade the quality of the transmit and receive signals. Other techniques are also possible, but we may come back to describe them later in this series.

Photo 2: A surface mount local oscillator by Daniel SM6VFZ.
Photo by Daniel Uppström SM6VFZ.

If we wish to use reasonable power levels on transmit, together with low noise preamplifiers on receive, we must also include a sequencer and/or IF interface into our system to ensure reliable operation without damage to system components. The sequencer will control the timing of the supply of voltage to the different system components – the receiver will be switched off before the transmit chain is supplied with volts. The transmit-receive changeover relay will be also activated before the transmit chain, ensuring that the relay has completed its changeover before power appears from the transmit chain. The converse applies when we switch back to receive. Failure to use a sequencer can result in the destruction of the receive preamplifier active device, damage to the changeover relay and/or damage to the transmit amplifier.

Sourcing a transverter for 23 cm

A number of designs of transverter are available for 23 cm. Several sources also have units available for other bands as well. Sources include DB6NT in Germany, SSB Electronics and Down East Microwave in the US. The kits or complete units from DB6NT are of high quality, but of course the costs are higher. Other designs are available – you can do your own searching through the Internet.

For VK amateurs, it is hard to go past the excellent kit available from Mini-Kits in South Australia. Mark VK5EME has an excellent transverter kit available that is easy to assemble and get on air. The design incorporates high quality helical filters. As well as the basic transverter kit, you will also need a Local Oscillator kit and a Sequencer or IF Interface kit. One should also consider a power amplifier and an LNA kit. To round out the system, a good quality RF coaxial relay is also needed.

Transmit power options

Unfortunately, as we go higher in frequency, RF power becomes more expensive to generate. This is primarily due to the cost of active devices, regardless of your preference for solid state or vacuum tube amplifiers. In addition to the amplifier kit from Mini-Kits, another reasonable source for a solid state amplifier at present is via Alan Devlin VK3XPD. Alan operates a business called RF Resale in Melbourne and currently has some surplus amplifiers that he has modified to operate on 23 cm. He has stocked a simple amplifier

needing only milliwatts of drive (straight from the transverter) to achieve 3 to 4 W output. If you have 1 W of drive available, that can easily be boosted to 15 W on a 13.8 V supply, or around 30-50 W if using a 24 V supply, using another of Alan's amplifiers. He also has a higher gain version of this second amplifier needing only milliwatts of drive, but these require a 24 V supply.

For higher power levels, one can consider combining multiple solid state amplifiers. The more usual route is to build (or buy) a cavity amplifier with a 7289 (2C39A) triode or similar vacuum tubes. Of course, this means high voltage supplies, consideration of cooling techniques, switching considerations and, of course, a very good understanding of RF safety issues. A single 7289 amplifier, with water cooling, can easily generate 100-150 watts of RF. At 1296 MHz, 100 W fed into a 1.5 m diameter parabolic dish antenna, via a feed line with a loss of 0.5 dB, generates a peak EIRP of over 20 kW!

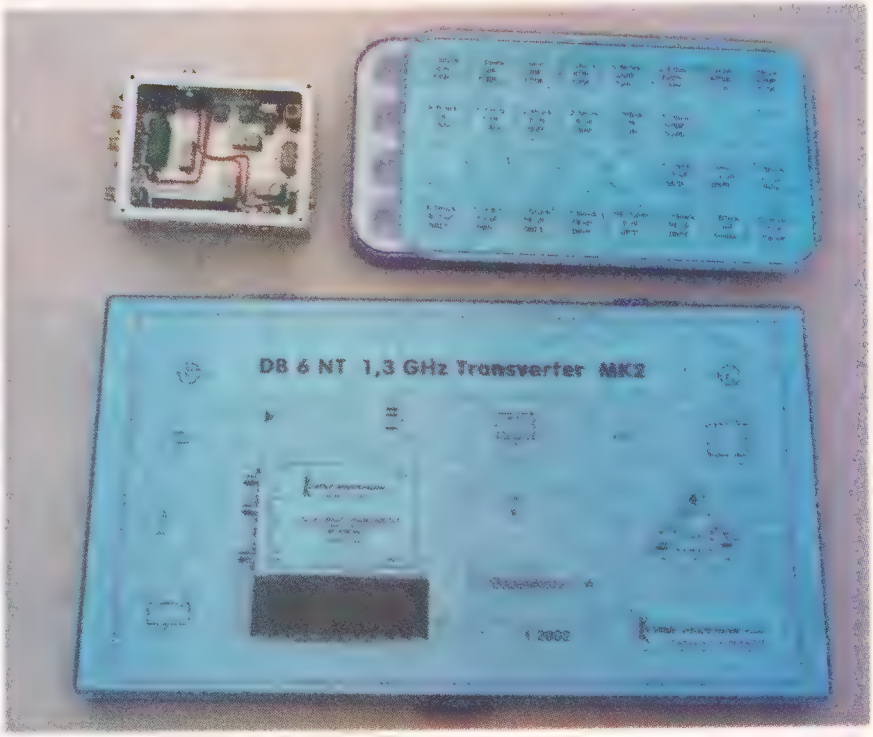


Photo 3: The DB6NT kit comes very well packaged. The completed unit packaged in the optional precision milled case is at top left.

Getting on air

Once you have done your reading and purchased the parts, you will want to put the kits together and get on-air. During the acquisition and construction phase, be sure to ask for advice and, if needed, assistance from others already on the band. How do you find them – ask around at the local club or chat with some of the amateurs who listen on the weak signal end of the 144 and 432 MHz bands. Even if the person you first talk to is not active on 1296 MHz, most will usually know the appropriate people for you to contact. Check that the gear is all working properly and then try it out. You may need to catch your local active amateurs on a lower band first, but most are usually happy to QSY to higher bands.

Good luck! If you are interested in the VHF /UHF contests, there is another good reason to become active on 23 cm – the band multiplier makes each contact more valuable!

Web sources:

Mini-Kits:
http://www.minikits.com.au/

RF Resale: http://www.users.bigpond.com/alandevlin/index.html

Kuhne Electronics (DB6NT):
http://www.db6nt.com/

Unless otherwise acknowledged, photos by the author.

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Yarra Valley Amateur Radio Group Inc.
C/o P.O. Box 346, Healesville, Vic, 3777

Sunday 24th February, 2008
10am to 2pm
Healesville Memorial Hall
Maroondah Highway, Healesville

For further information:
Steve VK3TSR
0418 103 487

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Sunday 20th January 2008

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8.30am start

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News from...

VK3

Amateur Radio Victoria News

Website: www.amateurradio.com.au
Email: arv@amateurradio.com.au
Jim Linton VK3PC

Season's Greetings

A reminder that the office at 40g Victory Boulevard, Ashburton, will close on Tuesday 18 December and reopen Tuesday 5 February. During the break urgent matters will be given priority while office-bearers work on financial statements and the annual audit.

On behalf of the Amateur Radio Victoria Council – Barry Robinson VK3JBR, Ross Pittard VK3FCE, Peter Mill VK3APO, Keith Proctor VK3FT, Terry Murphy VK3UP and myself, compliments of the season to all and best wishes for a Happy New Year.

The Secretary, Ross Pittard VK3FCE advises members that the Annual General Meeting will be held on Wednesday 21 May, at St Michael's Hall, corner Victory Boulevard and High Street, Ashburton, commencing at 8 pm.

Notices of Motion for the meeting close 2.30 pm on Tuesday 19 February. A further notice of the AGM and details of the business items to be discussed will be included in an annual report to members.

Guides enjoy JOTA

The 50th JOTA seemed to have increased activity on air this year compared with previous years and everyone declared it a great birthday occasion.

Amateur Radio Victoria responded to a request by the Dandenong Valley Region Guides who were camped at Rowville in Melbourne's south-east and eager to be part of JOTA.

Our Events Coordinator, Terry Murphy VK3UP, and Michele Grant VK3FEAT set up VK3WI portable much as they did for the International Lighthouse and Lightship Weekend in August.

Terry VK3UP says after a quick survey of the area it became obvious that a shelter-shed was an ideal operating position and a suitable tree nearby supported an inverted vee dipole antenna. The main equipment was a Kenwood TS-440S plus 2 m/70 cm radiated by a dual band vertical.

Guides enjoyed JOTA during their weekend camp

All was ready for a 3 pm start on the Saturday and after a brief explanation of how the radio worked and what to expect on air, the participating Guides threw themselves into JOTA.

The camp had other activities too but JOTA held its own against the competition and had a string of Guides enjoying the experience. An invitation was accepted to return and do it again in 2008.

Centre Victoria RadioFest (CVR)

Now the biggest amateur radio event of its type in Victoria, CVR promises another family-friendly and interesting program at Kyneton on Sunday 10 February.

A major feature will be D-STAR with product displays and expert demonstrations of the ins and outs of this revolution in amateur radio. The mini-lectures are back, as well as Terry Murphy's Dipole Factory, Club Corner, Scout Radio, WICEN portable emergency communications and F-Troop photo call.

Among the new activities are a VHF/UHF antenna gain measurement range (BYO antenna) and historical broadcast radios for sale by tender. All major commercial traders will be there plus second-hand sellers with some tempting items on sale.

The Organising Committee of this joint venture by Amateur Radio Victoria, Central Goldfields ARC and Midland ARC, plus a team of volunteers from the three organisations, look forward to seeing you there!

A full page advertisement in this edition of *Amateur Radio* magazine has more details and contact information.

VK3 Outwards QSL Bureau

The end of the year dispatch of QSL cards overseas has been sent for those registered users who had deposited cards with the VK3 Bureau which continues to provide its high level of service.

Recent changes announced by the WIA took affect on 1 December. This means that WIA members can post their outwards cards to the WIA Outwards QSL Bureau, PO Box 3073, Teralba NSW 2284, or they may continue to access the VK3 Outwards QSL Bureau at 40g Victory Boulevard, Ashburton.

The VK3 Outwards QSL Bureau will continue to receive pre-sorted cards for registered users, either individuals or bulk lots from radio clubs, under the established guidelines.

Cards received from overseas QSL Bureaux by the VK3 Inwards QSL Bureau will also continue to be provided to registered users, mostly through a network of club-based distribution points.

News from VK3 Clubs

Joe VK3FJBC

EMDRC IRLP and Echolink "Mythbuster" Session a huge success

A few months ago, the committee of the Eastern and Mountain Districts Radio Club were sitting around the fire discussing what could be the topic for in-flight entertainment at the October 19th coffee-shop meeting. After about three minutes of brainstorming, it was decided that a session on IRLP and Echolink was in great demand.

Just as you attempt to stifle the yawn at the mention of IRLP and Echolink, here is why the EMDRC decided that the members may possibly be interested in being lectured on the virtues of IRLP and Echolink. There are many people who use IRLP and Echolink occasionally and probably think nothing of it. After all, once you know how to use it, it is just like turning on a light switch…or is it? What if you did not know how to use it and did not have anyone who you could ask? What if you are new to the hobby and do not know how to use it or are too shy to ask anyone? What if you know how to use IRLP and Echolink and want to know more about their features and settings? What if you are a Foundation licensee and want to use these modes? What if the EMDRC had two resident experts who knew these subjects like the back of their microphones? Well, that is exactly what happened. So was born the idea of the IRLP and Echolink "Mythbuster" session. The "Mythbuster" term was used because one of the main reasons for this exercise was to bust some "myths" about how IRLP and Echolink can be used.

After much publicity (a big thank you to Amateur Radio Victoria, the EMDRC webmaster and the mailing list coordinator for their quick responses), the event attracted a minor traffic jam in the club rooms. You would be forgiven for thinking that it was a ham fest and not just a club meeting. The resident experts David Byrne VK3DRB and Perrin Trease VK3XPT gave the audience a live demo of IRLP and Echolink. It was only standing room for some as a crowd of about seventy people had gathered which even included some overseas visitors!

The audience was treated with historical information about IRLP and some fascinating insights into David's 2 metre node and its features. Then came a guide to using the website and how to interpret the information it contains. The club was blessed with high speed internet access for the evening courtesy of a 3G wireless modem from a local service provider so this made a live viewing of the website possible. This was followed by a live QSO with a station in the United States using David's Yaesu handheld and a barrage of questions from the audience.

Then came the Echolink session. Here again, the audience got to learn a few interesting things – like only about 20% of Echolink users actually use a computer to hook up with the system! This was followed by a guide to the website and a QSO between one of the laptop computers and the handheld. Then, just to "bust" a few more myths, the computers were shut down and the handheld tuned in to a local Echolink frequency. After having keyed in a node number for a friend, David's handheld was used to communicate with this station that was also on a radio. Look ma! No computers! The audience also witnessed how HF communications were made possible by one of the Echolink Links which was connected to a HF transceiver. Other features such as how to "join" in to a conference, how to change system settings, how to configure firewalls and how to set up an Echolink node kept the audience responding with lots of questions.

After a few eyeball QSOs with unseen voices and many cups of coffee, the curtain fell on an action packed coffee shop meeting. A few days later, the EMDRC received requests from other clubs to "borrow" our resident experts. They hope that the IRLP and Echolink "gurus" are consulting their diaries to find some time. A big thank you to David and Perrin for taking the time off from their busy schedule to give us an insight into these subjects and making the evening a huge success.

continued on page 45

VK9WWI, Willis Islets, North Cay

September 22 – October 3, 2007

George Wallner AA7JV and Tamas Pekarik HA7RY

This was intended to be a simple "personal" DXpedition that would be combined with diving and spear-fishing. Equipment was chosen as the minimum required for meaningful low band operation. The budget was also moderate, relatively speaking.

The location

Willis Islets are located around 16.5 degrees S and 150 degrees E, off the east coast of Australia, about 500 km east of Cairns. The group contains three islets; South Islet, Mid Islet and North Cay. There is a meteorological station on South Islet, which is manned by four weather observers. This is by far the most easily accessible islet. Mid Islet is seven km north of South Islet, about 300 metres across and covered with low, scrubby vegetation. North Cay, a low sand cay about 1.5 km long and 300 m wide, is located eight kilometres further to the north of Mid Islet.

We decided to locate the station on North Cay. As far as was known, nobody had operated from North Cay before and it appeared large enough for a sizable beverage with an east-west orientation.

Access to North Cay is difficult because of the surrounding coral reefs, which at low tide uncover. We were able to find a wide enough channel in the coral (about 1.5 m wide and winding!) for the dinghy, at the west end of the cay. Through this channel we ferried the gear ashore, which was off loaded on a narrow sand spit at the western end of the cay. This is where we set up the station: on the western tip of the cay, just where the sand spit joins it.

Willis – especially the North Cay – is a tough place to operate from. There is nothing on the island except birds. No hotels, no water, no power, not even a tree! You can not keep a boat on station nearby because of the rough conditions. You are on your own.

Photo 1: George and Tamas at the VK9WWI operating site

Photo 2: The 20 metre fibreglass pole supported the 160/80 m antenna. No problem with a ground plane here!

The equipment

Our equipment consisted of an Icom IC-746 Pro, an SG-500 solid state 500 W amplifier, an SG-235 auto tuner, and an MFJ manual tuner. All equipment

was powered from four 12 V car batteries which were charged by two 30 A chargers powered by a 1.5 kW Honda generator. Logging was done on a lap-top, which was also connected to the rig (a must for efficient DXpedition operation and subsequent QSL-ing!). We also had an Icom IC-706 with an AH-4 tuner as a back-up. Not a "big-gun" expedition set up!

We had a single tent with a tarp for awning, under which we placed the operating table with all the gear piled on it, and under it. We had minimal amenities. (We did not have hordes of hired labourers to set up a tent city, and antenna farm.) Fuel for the generator was carefully calculated at 100 litres. Although Tomi was constantly worried about us running out of fuel, we finished up with about 20 litres left – enough for a day of operation. We did not have internet access, although we had a satellite phone, which worked about 5% of the time. For communications we had amateur radio!

We operated under some difficult conditions; the tent was cramped and was constantly flapping in the brisk breeze that never seemed to let up. This caused serious QRN! We had difficulty copying weak stations on 160 even with noise cancelling head-phones on. For an entire day and night we endured a storm that almost flattened the tent; we used driftwood to shore it up. Making regular trips to the generator – which was sited about 150 metres away for reasons of noise – was no fun either in the blowing rain. It appeared that we had technical problems, but really we were just very busy; the two of us had to keep things going and operating at the same time.

There was one technical problem that hampered our operation. Our PA, a 10 year old SG-500, had a slow T/R switch, which cut the first dot of a call off when operating high speed CW, causing many repeats and the need to reduce sending speed.

The antennas

For antennas we had one 12 and one 20 metre SpiderBeam fibre-glass pole, with home made galvanized-steel bases. We set up the 20 metre pole on the sand spit, with an inverted L that was cut for 1.825 MHz, with the "horizontal" wire being held by the 12 metre pole which was set up on the island about 100 metres to the east. The wire could be lowered for 80 m operation. We added 12 elevated radials of between 10 and 30 metres long and about 0.7 metres above the sand, with some extending into the water. We also added a 2 metre long ground rod; the sand appeared to be wet there at all times, so it may have done some good. At high tide the entire sand spit, including the base of the antenna, was under water. We believe that the location of this antenna was about as good as it could get; surrounded on all sides by sea water, or standing in sea water at high tide. Looking at the EZNEC model of this antenna one would think that on the higher bands the antenna would perform poorly, with too much high angle radiation, but the log proved otherwise. Sea water seems to make vertical antennas work very well – or at least does not make them work poorly.

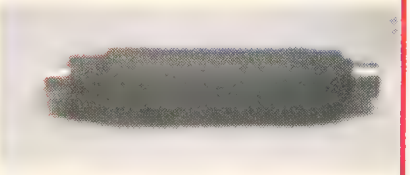
We set up a second vertical on the 12 metre pole for the higher bands, but as it turned out, we kept using the larger antenna on these bands out of convenience. This pole, however, turned out to be very useful for the Pennant receiving antenna we erected later.

Receiving antennas

One goal of the operation was to activate VK9W on 160 metres. During the short planning phase we sought the advice of experienced 160 m operators and previous DXpedition members regarding receiving antennas for the low bands. Interestingly, the advice fell into two distinct categories, almost evenly divided. One group stated that on a remote location like Willis there would be no need for separate receiving antennas because of the absence of man made noise. The other group stated that receiving antennas are a must because of likely noise from tropical thunderstorms and the Chinese "Dragon" HF over-the-horizon radar, which has one of its operating frequencies in the 160 m band. As it turned out, both groups were right. On some nights the Tx antenna worked fine, on other nights the lightning crashes made listening on the Tx antenna painful. More on this later in the Operation section.

During the course of our ten day operation, we erected two receiving antennas. A pair of Pennant antennas was loaned by W8UVZ. One of these, aimed at North America, was installed

TVI High Pass Filter with Braid Breaker



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on the second day. For supports it used the 12 metre SpiderBeam pole and a newly erected driftwood bamboo pole. The centre of the antenna was about five metres above ground. It worked fine for the NA direction, drastically cutting noise of lightning crashes. Still, the antenna produced very weak signals, even with a K9AY pre-amplifier (which was loaned by Gary K9AY). On the fourth day we built a 140 m long beverage antenna, laying in a 80 degree direction (EENE); not perfect for North America, but that was the best we could do given the shape of the island and the desire to stay far from the salt-water. The beverage worked so well that a couple of days later we cannibalized wire from the short vertical and extended it to 220 metres. A strange thing occurred at that time. The antenna, which in its shorter form did not pick up noise from our generator, which was about 60 metres to its side, now was picking up generator noise. (Be aware of these new generators with "inverters"!) The generator was located about 100 metres from the operating position and about 200 metres from the main antenna. Its power cord was curled into chokes at several points and it was grounded. This configuration eliminated some early noise pickup. The extended beverage, however, was now picking up generator noise; but it also produced much better signals, especially on 160 m, and the noise was easily removed by the receiver's noise blanker, so we decided to stay with this new configuration. The beverage worked very well for us for the rest of the operation. It was very good on 160 metres and it was superb on 80 metres. Its directivity was so sharp that on 160 metres we could switch between working Japanese and North American stations just by switching antennas and doing away with the need to listen up 5 kHz to get away from the large number of Japanese stations calling! The beverage just simply cut them off, except for the very loud ones. (I had missed KL7FG calling several times, until I switched to the vertical, on which he was S9!) For Europe, which started coming in the early morning hours, we removed the loading resistor, turning the beverage into a bi-directional beverage, which, despite its poor orientation, was still much better than the Pennant or the main antenna. An interesting point to make here; beverage antennas rely on poor ground and are reputed not to work on small islands or close to the sea. Our beverage was running parallel to the shore about 30 metres from the high tide water line and over sand that was about three metres above the high tide sea level (five m at low tide). The sand was dry in that area and very likely a poor conductor.

Operations

This being a "private" DXpedition, we did not start out with any major goals, except to work on 160 metres and to make as many QSOs as possible. Tomi HA7RY did most of the high band operation, and George AA7JV did most of the low band operations.

It became quickly apparent that our main antenna was working very well. We were often able to work with only 100 watts and still remain in control of the pile-ups. North American stations, especially on 80 metres, were also strong, well into the early morning hours.

It did not take long to find out that we were being sought after. The pile-ups, especially on 40, 30 and 17 metres, were big. Being close to Japan, the Japanese stations were numerous and loud. Fortunately, they were also well disciplined, which allowed for a reasonable QSO rate. The same can not be said for the rest. While the US stations were relatively well behaved, many European stations were unruly. It is worth pointing out that the QSO rates were much higher when propagation was mostly to Japan. This was largely due to the more disciplined operators, who instead of causing QRM waited their turn and timed their calls correctly.

Worse than undisciplined operators were those who could not hear us at all, but kept calling regardless. The DX station can quickly tell when somebody can not hear him and is just calling based on DX Cluster data. Such an operator not only makes a fool of himself but also causes substantial QRM to the detriment of everybody. Essentially he denies the DX to others while he is unable to get it for himself! This is one area where national organizations could do a lot more to educate operators.

Although it is important to call a DX persistently, it is important to time the calls well and to listen between calls. In fact listening is the most important part of getting a rare DX station. To know when the DX is listening, it is important to discern his operating pattern. Calling him whilst he is transmitting, or working somebody else, will get you nowhere. We could instantly identify the experienced operators who were often able to get through on their first call, which was well timed and on a well chosen frequency. You can do that only by listening for a while and learning the pattern of the DX! Big antennas and multiple kilowatts will not do that (although they help).

Dead bands?

When we arrived on Willis our first impression was that the bands were dead. North American or European stations can not imagine how dead the bands can be so far from civilization. One could have easily thought that there was no propagation. Once we sent a few CQs, however, first a few stations would appear, and then when we were spotted on one of the DX clusters, all hell would break lose, and suddenly a previously dead band would be boiling with calls from many areas. Suddenly, propagation would go from zero to excellent (despite the bottom of the sunspot cycle).

The first night

We arrived at North Cay during the early afternoon of September 22. After we ferried the gear ashore, we set up the tent and one antenna mast. We were planning to complete setting up next day, to be ready by the evening of September 23 for Top Band. Tomi, keen to get going, spent the first night on the island and operated with a temporary set-up.

(I believe that he was also keen to get off the boat which was rocking and rolling widely in the large unprotected waters south of North Cay.) Tomi was using a piece of sloping wire tied to the tip of the 12 metre SpiderBeam pole, fed via a manual tuner, running 100 watts off a 12 V car battery. Logging by hand on pieces of cardboard (he had left his computer on board), he was able to make 450 QSOs, working through the night, mainly on 40 metres. As it turned out, this was a much welcomed part of the operation, as later we were concentrating on 160 and 80 metres at night.

160 m operation

We spent September 23 setting up the station. The inverted L went up, we installed radials, got the generator going

(and moved it to get rid of its noise) and set up the logging computer, alongside a myriad of other small things. We were ready by 6:30 PM local time and tuned the radio for 160 metres. It was going to be one of those magic nights that probably occur once in a life-time.

Our first CQ was answered by JA7FUJ at 0838. A long string of JA and North American stations followed. At one point we had to listen 5 and 6 kHz up to hear the North American stations. The first European station was UA4DX, two hours ahead of any other European (I had repeatedly copied him as VA4DX – not wanting to believe that the band would already be open to Europe). The North American stations started to fade out after their sunrise at 1400 and European stations started to come in long strings. Altogether we made 430 QSOs on top band that night.

Signals from both North America and Europe were strong and clear, with little QRN. We did not have a receiving antenna up yet; we were using the inverted L for receiving. The Dragon was also quiet. Indeed, 160 metres had the feel of 80 metres on a very good night. At that point I was convinced that those who suggested that there was no need for a separate receiving antenna were right and things would be easy. The next night proved the need for separate receiving antennas; in the early evening hours lightning crashes were so strong that they were painful through the headphones. Eventually we gave up on top band for a while and QSYd onto 40 metres for a couple of hours. By then Top Band had quietened down (the thunderstorms must have dissipated) and we had a decent night of operation. Next day, we installed the Pennant, which then proved its value during the next two nights, after which the beverage took over and we rarely used the Pennant any more.

Altogether we made 1200 QSOs on top band

A couple of observations are due. When calling a DX on 160 metres, unless you are very confident of your full size array and kilowatts, you should send your call-sign two or three times. Due to noise, weak signals and QRM, it is common that the operator picks up only part of a callsign each time it is sent. A lot of time was wasted by repeatedly asking stations to resend their callsigns. Sending speed should be between 12 and 25 wpm, neither faster, nor slower! The problem with slow speed is, in this part of the Pacific anyway, that there are a number of beacons that can be heard across the 160 m band and these beacons transmit at about 5 wpm. I believe them to be long-line fishing beacons, as they constantly change, drifting with the currents and are removed at intervals. They are easy to separate from calls provided the calls are at higher speeds. Speeds faster then 25 wpm are difficult to copy due to lighting noise or the Chinese "Dragon" triggering the noise blanker, which in turn can obliterate high speed dots.

Again, if you can not hear the DX do not call! This is especially true for 160 metres, where the above mentioned problems are compounded by the QRM of out-of-synch calls launched at random.

One misconception about 160 metres is that a station should focus on its ability to receive. This is only partially true; you must be able to hear the DX, but one station's Tx signal is the other station's Rx signal and when you start out with a weak Tx signal, you will simply not be heard. If you want to do DX on low band, you have to have a decent Tx set-up, in addition to the ability to hear. It is simply a matter of signal-to-noise ratio and the noise is a given.

Operations on other bands

80 metres was a strong and reliable band for us. Both North American and European stations were loud, as were the Asian stations. The beverage proved to be very useful on 80 metres, as this band was also affected by lightning noise.

40 metres was dominated by the Japanese, as well as the European stations most of the time. The Chinese "Dragon", however, seems to be centred over the CW portion of the band and creates very substantial interference. A good noise blanker seems to be able to deal with it, but signals get degraded.

30 and 20 metres performed as expected.

17 metres was the most reliable day-time band! It was often open to Japan, Europe and North America at the same time.

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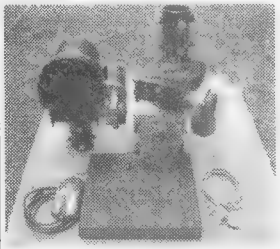

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15 metres opened at times to Japan, with a few Europeans mixed in.

12 metres had a few surprise openings to Asia, when stations were very strong.

10 metres: no QSOs. Hey, you can only do so much with a single station!

Final QSO Count

Band	CW	PH
160	1211	0
80	1556	49
40	1478	7
30	1139	0
20	1174	733
17	1767	556
15	703	142
12	221	97
Total: 10834		

Note that the totals do NOT include duplicate QSOs, of which we had a lot!

The 'Dragon'

The Chinese HF Over-The-Horizon (OTH) radar, called 'Dragon', is a real menace to HF amateur radio! It degrades 160 and 40 metres substantially. It also appears that its main transmission frequencies are intentionally centred on amateur bands; perhaps these bands are seen as the least important and poorly defended. Hopefully, they are still in a testing phase and once they are operational they will use it less frequently. We also hope that the practise does not spread to other under-developed military hopefuls, who may see HF OTH radar as a cheap alternative to AWACS!

Summary

We would like to thank all those who contacted us. We also appreciate the efforts of those who tried but did not make it into the log. We know that a lot of people wanted more 40 m operation, digital modes and so on. Please understand that we tried to be even handed, but with a single station, and two people doing everything, you can not make everybody happy.

Overall we are content with our operations. We are especially happy with our 160 m results. They show that when receiving conditions are good, and the interest is there, a relatively modest station can do a lot on Top Band.

ar

Photo 3: A view of the antenna supports and camp site

Photo 4: The generator was placed well away from the tent

Photo 5: Tomi HA7RY and George AA7JV had an enjoyable eyeball QSO over lunch with Allan VK2GR on their return to Sydney from the VK9WWI Willis Islets North Cay DXpedition

continued from page 39

Geelong Amateur Radio Club – The GARC

Tony Collis VK3JGC

GARC prides itself on the diversity of activities undertaken by its members, beyond conventional radio communications.

As a member of Lee VK3PK's micro processor group at the GARC, David Haggart VK3VLH was until recently VK3FCAT, graduating earlier this year to his Standard licence.

At the time of the National Robotics competition, David was a student at the Bellarine Secondary School where he undertook a project to build a heavy weight robot capable of playing soccer.

The sponsors of the project were Google, The Ford Motor Company and Wiltronics, with Gee-Tek of Geelong providing the high intensity LEDs required. The construction of the Robot started in December 2006 and was completed at the end of June 2007 ready for the Victoria state competition on 4 July 2007.

The 3 kg robot playing soccer

David won first prize for his entry together with an award from Deakin University recognising the complexity of the design and its operational capability.

David then went on to the Australia wide finals held at the Gold Coast Exhibition Centre for a two day event on 1st and 2nd of September 2007, where he came Fourth in the National finals.

QTC VK4

First Published July 1942 "Of, By and For the Amateur"

News from for Queensland Radio Amateurs

Rossco VK4AQ

Compiled from own and contributed resources.

2007 Queensland Presidents' Lunch

The Queensland Advisory Committee continued the tradition of an annual Presidents' lunch at the Geebung RSL Club on 13 October 2007.

The lunch was attended by the presidents or other representatives of some 17 clubs from the Atherton Tablelands in the North to the Gold Coast in the south, with members of the Queensland Advisory Committee, WIA President Michael Owen VK3KI, WIA Vice President Ewan McLeod VK4ERM and WIA Secretary (and with Pat Fuller, organiser of the lunch) Ken Fuller VK4KF.

Michael gave a report on the current WIA activities, including interesting

statistics in relation to new amateurs, the distribution by State of Foundation licensees, the age and gender distribution of Foundation licensees and the number up grading.

It was generally agreed that the number seeking to up-grade was very encouraging and there was considerable discussion of the best means of attracting new amateurs.

Vice President Ewan McLeod gave a brief report on current developments in the WIA's role in emergency communications.

The next day, Sunday 14 October, Michael, Ewan and Ken were guests of the Ipswich and District Club, welcomed by President Michael Charteris VK4QS and other members for a very pleasant barbecue, and again, a report on WIA activities from Michael.

The Ipswich club has encouraged membership of the WIA by meeting the membership fees of some members, then recovering it by small regular payments.

Ipswich & District Radio Club

From Mike VK4QS

Some time ago, on July 28th this year, the Ipswich & District Radio Club played host to what is hoped to be an on-going social event called the "Inter-Club-BBQ".

This saw members of the Brisbane Amateur Radio Club, City of Brisbane Radio Club as well as the Lockyer Valley Radio Club come together at the Ipswich and District Radio Club for a day of social exchange as well as a beaut BBQ to top it all off. There was even a Boot Sale with equipment changing hands and happy faces all round.

Special guests for the day included Gerry Millward, the head of ACMA for Queensland, Northern Territory and the Kimberleys, and Ewan McLeod VK4ERM, Vice President of the WIA.

It is fair to say that a great time was had by everyone and the BBQ was a true success as nothing was left to spare at the end of the day.

It is hoped that this event will lead to a series of Inter Club BBQs in south east Queensland area so that we might gather and get to know each other face to face instead of just being a voice behind a call sign. In early 2008, the BARC will be organising a similar event and we look forward to the gathering with great interest.

On Sunday October 14th, members of the Ipswich & District Radio Club played host to the President of the Wireless Institute of Australia, Mr. Michael Owen VK3KI.

This followed a successful Presidents' Lunch on the previous day that was held at the Geebung-Zillmere RSL Club, which was attended by Presidents and Committee members from as far north as Townsville.

Each year it has been the tradition that, on the Sunday after the Presidents' Lunch, the President of the WIA has been invited to one of the Radio Clubs here in Queensland.

In previous years Michael has attended the Sunshine Coast and the Gold Coast for a most enjoyable day with their members. This year the focus had a more Westerly approach with members from the outer Western clubs from as far away as Dalby and District being invited to attend a somewhat Western Clubs BBQ with the benefit of meeting Michael and catching up with the latest WIA News.

We were graced with a mild spring day with a slight breeze, which made for an excellent atmosphere in which to relax. By noon the BBQ was fired up under the watchful eye of "Cook for the Day" Rob Bryce VK4HW. With steaks and drinks all round we lazed the hours away with much discussion about amateur radio in general.

After lunch, Michael was kind enough to enlighten those present with the latest WIA news about the success of the Foundation Licence, and to emphasize the importance of "New Blood" by way of this excellent introduction to our wonderful hobby.

To this end, here at the Ipswich Club, some five members attended the recent Assessors Course on the Gold Coast, and they are currently awaiting their certificates. Michael also stressed the importance of our representation at WRC 2007, and what it meant for us as amateur radio operators here in Australia.

Following this, all and sundry were happily assembled for a photo shot, with Michael Owen. It was after this that the President of the Ipswich Club, Michael Charteris, VK4QS, on behalf of the club members, thanked Michael for his visit and presented him with the lovely and distinctive "Ipswich Pride Pin" together with an "Honorary Vice Presidentship" of the Ipswich and District Radio Club.

So ended one of the most enjoyable days the Ipswich and District Radio Club has ever had in the past 45 years of existence. Our members thank Michael for visiting our club and trust he might return one day in the very near future.

Ipswich & District AGM, held on August 27th 2007

Office bearers for the upcoming year include:

President:	Mike Charteris VK4QS
Vice President:	Wayne Bryce VK4AB
Treasurer:	John Edwards VK4IE
Secretary:	Bob Beck VK4CPM
Station Manager	Rob Bryce VK4HW

The Club is looking forward to a big year with a lot of work to do on the Clubhouse as well as a host of WICEN events.

A group of five of our members, Mike Charteris, John Edwards, Gary Neilsen, Bob Beck and Rob Bryce recently attended the two day Assessors Course, held at the Gold Coast Radio Club, so they could undertake examinations for the budding amateurs in the District.

It is full steam ahead for Ipswich and District, which is looking to grow the Club this year with lots of inquiries for the Foundation Licence.

Club meetings are held at the clubhouse at 10 Deebing Street, Denmark Hill, on the 2nd and 4th Monday nights of the month at 7.30 p.m. and all are welcome. Coffee and tea are also put on by the Club free of charge. The club looks forward to seeing you there.

APRS – South East Queensland

From Peter Schrader VK4TGV

It has been recently determined that the APRS digi-peater network in SEQ requires a re-examination.

This mode has too much potential to let the network go custard apple shaped, so in the interests of developing this mode further all interested parties are encouraged to join the Yahoo group created for this purpose.

The link is http://groups.yahoo.com/vk4aprs This group contains valuable information for configuring your APRS station, along with ongoing discussion to improve and expand the network in South East Queensland.

Central Highlands in Central Queensland

Gavin VK4ZZ advises that a new repeater was recently added to the Central Highlands radio network.

Roy VK4YRO, Tony VK4HOG and Steven VK4SMW went to Mt Seaview to complete the installation of the repeater on the frequency 146.975 MHz.

It has an output of 50 watts and is fed into a large four bay offset dipole array.

Controller, Roy VK4YRO, extends his thanks to Rob VK4HW and Andrew VK4OX for their tireless efforts in getting this station up and running. An APRS is also located at this site.

Dalby and District Radio Club

On the weekend of 1st and 2nd of December, the Dalby and District Radio Club will be camping out at the Chinchilla weir.

This will include a camp oven cooked tea on Saturday night and a BBQ lunch on Sunday.

The usual car boot sale and a short club meeting will be held on Sunday morning.

Members and visitors are invited to go along and join in the fun.

Tablelands Radio Group

A very busy and successful month of activity, from both the amateur radio and social scenes, was reported by Mike VK4MIK.

Many experimental antennas are being assembled within the group and these will be put to the test in a range of activities planned for the next six months. Antenna trials will be conducted during contests and on a couple of camping expeditions that are currently on the drawing board for after the wet/cyclone season.

A "Great Mates Luncheon" attended by 16 members of the group was held at the Barron Valley Hotel in Atherton at the end of October and another is planned for December. The very cohesive TRG tries to visit a new eatery every six weeks or so.

Next month I hope to be able to report on an initiative from the Ipswich Club on a novel approach to improving WIA membership within the State.

Finally, another point of interest that all amateurs should be thinking about, now, is the 100 years of Amateur Radio in Australia: the anniversary comes up in three years time, if my memory serves me correctly.

There are local thoughts of possibly producing a "coffee table" book, of very high quality, covering the 100 years.

It behoves upon every amateur in the country, particularly the old timers, to start thinking about this event and sorting back through their archives for suitable material so that, if the venture does come about, everything is not left until the last minute.

VK5

Christine Taylor VK5CTY

Adelaide Hills Amateur Radio Society

By the time you read this, the big event of the year will probably be over. If you were not at the Buy and Sell on 17th November, you will have to wait till next year.

The meeting in November was a construction night at which everyone built a "Gizzmo" under the tutelage of Graham VK5ZFZ.

These nights are usually lots of fun but quite testing especially for those with eyes that have 'been around for a while', nevertheless a good time is had by all.

The October meeting was another interesting talk by someone who had worked behind the scenes in the world of espionage. Without giving away any secrets we were given an insight into some of the techniques and the problems associated in keeping our nation secure. He had some tales to tell about the different problems and conditions encountered in the various countries he had visited. Fortunately, as we were assured, the changes in equipment in the world of communications is a constantly changing one, so it is unlikely that much of his knowledge would be of use today, even though it is not many years since he retired. Only those in daily contact can keep right up-to-date. However, the motto, because it is new it is not necessarily better, does apply. It is not always better, merely different.

As always, we had 60 plus at the meeting and expect as many to try their hand at construction at the next meeting.

Information is always updated on the AHARS website www.qsl.net/vk5bar/ The 2008 calendar for the start of the year is there: if you expect to be in Adelaide, so keep an eye on it.

SEASON'S GREETINGS TO EVERYONE

News from...

Assessor training update

John Elliott VK5EMI – Convenor

The second Assessor training session for VK5 took place over the weekend of 4th – 5th August, at St. John Hall, Unley, under the capable control of Fred Swainston.

Participants came from far and wide; from Cowell on the Eyre Peninsula, from Port Augusta, and the Riverland, as well as the wider Adelaide metropolitan area.

Fred led them through the many complex issues that assessors will face with their work.

"This was not what I expected", stated one participant, "but in fact better and more useful to me".

Best wishes to the new assessors – may you find plenty of examinations to assess!

WIA VK5 Assessor training group, 2007.

Standing (L to R): Fred Swainston VK3DAC, Jim Walford VK5AJW, Malcolm Gardner VK5MJ, Kevin Zietz VK5AKZ, Tony Hughes VK5KAT, Leigh Turner VK5KLT, Steve Baker VK5UQ, Norm Lee VK5JNL, Robin Devore VK5ATT.
Sitting (L to R): Graham Holman VK5GH, Peter Horgan VK5BWH, Steve Mahony VK5AIM, Barry Williams VK5ZBQ.

Thanks to the WIA, Fred Swainston VK3DAC and Peter Reichelt VK5APR for their essential part in the running of this important event.

AHARS John Moyle Memorial Field Day 29.03.2007

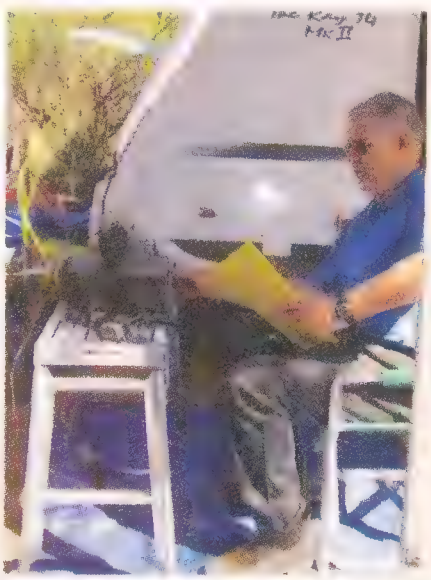
As they have done for several years, AHARS went to a 30 hectare, Mallee scrub covered property near Swan Reach for the Field Day weekend. There is a two-storey shack built by Geoff VK5TY and Christine VK5CTY (and friends) which provides sleeping quarters for the amateurs and plenty of space outside in which to erect antennas and set up field stations.

There are antennas already on the property, but none of them are used during the Contest. Some of the four towers are used as anchor points for the wire aerials. All the contest aerials are erected either late in the afternoon preceding the contest or on the morning of the contest.

In 2007 one of the participating amateurs, Rufus VK5YO had a GPS unit with him with which he plotted the location of each of the portable stations. He superimposed these on a Google Earth map of the block to produce the image that accompanies this article.

The 80 metre station, the 10 metre and the 40 metre station were under gazebos, the 20 metre station used an existing shed but the 15 metre station was erected just under the trees. The rig for this station was an FT-857D with gel cell batteries as

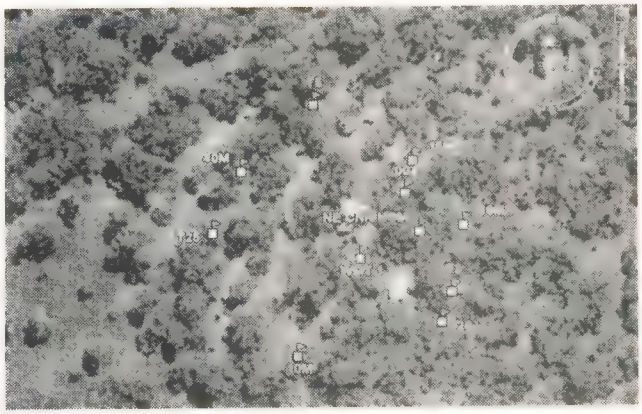
The proud operator of the 80 metre rig, Karsten ZK5ZKT, who worked all through the night for a massive score



The 10 metre station set up by Robert VK5ZHW with a special ground arrangement . Not sure how effective it is as few contacts were made on 10 metres – normal situation

The 80 metre rig

Above: The 40 metre station ready to go.
Left: the 40 metre aerial with balun and vee beams



The Google Earth picture with the rig locations plotted

the power supply.

For 10 metres, a dipole was erected anchored at the centre to T3, and at the ends to some trees. For 10 metres we used a long wire anchored to WMT at one end and a tree at the other end. Ladderline fed from this aerial and a matching length of wire provided a ground. Unfortunately we had no contacts on 10 metres, though a few stations were heard talking to each other.

For 40 metres, a collapsible mast with two sets of guy wires supported the centre of an inverted Vee aerial and powered by solar boosted batteries.

The 20 metre rig, a Kenwood TS-43x was fed from a dipole supported at one end by a wooden pole erected on the morning of the contest with the other end tied to T3. A Dewton tuner and pre-charged batteries completed the equipment.

A G5RV antenna was used for 15 metres, suspended from trees.

The permanent aerials on the block are described here just for information.

T5 and T25 have wires running from them to the windlite tower, WMT. The vee enclosed by the wires is aimed at the UK and Europe, fed by a homemade ladder line through the window of the shack for use on 20 and 40 metres. A permanent G5RV runs between the windlite tower and T3 for use on 80 metres.

VK7

Justin Giles-Clark VK7TW
Email: vk7tw@wia.org.au
Regional Web Site: reast.asn.au

Congratulations to Rosanne VK7NAW for being the top VK7 ALARA member in the ALARA contest.

Hayden has commissioned a new 70 cm repeater in Huonville, South of Hobart. Callsign is VK7RCH and frequencies are 438.575 MHz RX and 433.575 MHz TX. No tone is required.

JOTA was a great success in VK7 with at least eight stations provided by radio amateurs. In the North, Tony VK7YBG and team provided a well equipped station on Scout Island in the Tamar River. Thanks to VK7s HDX, ZCF, FMWT, TTT, ZJA, XGW, AN, YUM, YAD, ZPE, HAM and FYBG for helping with this station. In the North West at Paton Park, Wayne VK7FWAY, Ivan VK7XL and Tony VK7AX manned the station VK7SDL.

The South was well covered. At Glenorchy, Danny VK7HDM manned the station. Ray VK7VKV manned the station at New Norfolk. At The Lea Scout camp Roger VK7ARN, Chris VK7FCDW and John VK7ZZ operated VK7SAA. At the Howrah Scout Hall, Thomas VK7FDAE, Allan VK7FWAG and Rosanne VK7NAW operated VK7OTC. At the Snug oval, Scott VK7FREK and Bruce VK7MDB operated VK7GGA and have introduced a "Chatterbox Award"! At the Blackmans Bay Scouts, Rod VK7TRF, Mark VK7FMDF, Gary VK7JGD and the author manned VK7SBB and this included communication over red light for the cubs on Saturday night.

I alert interested people to a new VK7 BPL video titled *"Are you ready for BPL in your neighbourhood"* which is now available on YouTube. This complements the existing VK7 virtual tours of Mt Nelson and North Hobart that together have been viewed over 16,000 times. Go to youtube.com and search for BPL and Tasmania.

November 4 saw the Sewing Circle

News from...

Blackmans Bay Cubs with light communications during JOTA

BBQ at the QTH of Ken VK7DY and Wendy VK7FWJS at their property at Orielton. 80 people attended with about 50 being amateurs. There were homebrew competitions for the F-Troop amateurs, amateurs and XYLs. There was vigorous trade at the trading tables. The Terry Wilson VK7HTW (silent key) Award was presented to Sam VK7FBMX for services to amateur radio in VK7. Brian VK7KBE presented the Sewing Machine award to the most loquacious amateur on the Sewing Circle net, which for the coming year is Jerry VK7EE. The big hamper of goodies was won by Vince VK7VH. From those I have spoken with it was a great day. A big thank you goes to Ken & Wendy and all their helpers.

Some of the VK7 Sewing Circle BBQ attendees

North West Tasmanian Amateur Radio Interest Group

Congratulations to Keith VK7YBP who is now a WIA Learning Facilitator in the North West. Congratulations also to Bill Kitson who has passed his regulations and is off on his grey nomads tour of VK. 1250 MHz ATV experimentation is taking place between Ivan VK7XL and Tony VK7AX, with tests on 2.4 GHz links planned to follow shortly.

Northern Tasmania Amateur Radio Club

The October meeting was at the Mt Barrow Interpretation Centre where almost 40 crammed into the shed. The weather was extremely kind with much story-telling and reminiscing done. The BBQ and fire raged into the night and a great time was had by all.

WICEN Tasmania (South)

The newest club in VK7 is WICEN Tasmania (South) Inc., which aims to establish and maintain a core group with a voluntary public service and emergency radio capability of the highest possible standard and to work with the broader radio interested community (not exclusively Amateur Radio) to extend that capability.

Radio and Electronics Assoc. of Southern Tasmania

Congratulations to the following people who have successfully completed their Standard Licence theory: Derek VK7FINE, RobertVK7FROB, Roger VK7FRMH, Chris VK7FCBH, Tom VK7FDAE, Graeme VK7FGJW, and Len Gay. By the time you read this, they will be on the air as Standard licence holders. The author is now a WIA Learning Facilitator for the REAST club.

REAST's November presentation was by Brian VK7RR on his remotely controllable amateur station. Brian outlined the SteppIR antenna, an automatically adjusting HF beam and a key element of his station. Brian then explained the hardware and software that enables him to remotely control his station. This was a very impressive demonstration of state-of-the-art internet technology and equipment and a practical demonstration of its capability. Thanks Brian.

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Silent Key – Crosby Green VK7CR

It is with deep regret that we announce the passing of Crosby Russell Green VK7CR.

He was a very active amateur in the 60s and 70s with a beautifully crafted voice (VK7 Canada Radio).

When the Southern Branch of the Tasmanian Division of the WIA used to meet on Liverpool St, Hobart, Crosby was the WIA Librarian for many years.

Crosby unfortunately has not been heard on the air for many years.

Vale Crosby.

(Brian VK7RR & Richard VK7RO).

Christine Taylor VK5CTY

Season's Greetings to all

The committee and all the members wish everyone a Happy Christmas and New Year. Enjoy your family, enjoy your holidays if you take them now, and enjoy your/our great hobby.

It has been a good year for ALARA and for amateur radio. We have many new amateurs and ALARA has gained many new, enthusiastic, YLs. Our Contest was one of the best ever and propagation seems to be improving so maybe we are coming out of the bottom of the sunspot cycle.

The coming year promises to be another good one with better propagation conditions and so many new amateurs.

Planning 2008

Please put the ALARAMEET in Ulverstone on your list for September 12-15 2008 if you are a caravanner or even if you are not. The weekend starts with an informal dinner on Friday evening, then two days of interesting tours and meals in interesting places with lots of time to talk in between, and ends with the formal handing over of the ALARA banner to the next co-ordinator and the announcement of where we will meet in three years time.

However, there is a lot more than that to the ALARAMEET. You can put faces to the voices you hear on the air, you and your OM and family share in the wonderful friendship and leave looking forward to the next time you will meet.

Most people meet a few days before the weekend and often plan to stay on and do some more touring after the ALARAMEET.

The co-ordinator for the ALARAMEET in Ulverstone is Susan VK7LUV so contact her for more information. Her email address for the ALARAMEET is vk7luv_susan@yahoo.com.au

Tina VK5TMC is hoping to arrange some cheaper fares on the ferry from Melbourne. If you are planning to travel that way with or without caravan, please contact her by email on rtclogg@optusnet.com.au re dates etc. Fortunately the lower costs are available for those who are unfortunate enough to have to pay non-concession fares, but the numbers will all help to know if she can make this arrangement. Please do contact her as soon as you have made your plans.

In October 2008, there will be an international YL Meet in South Africa. This MEET will be held in a number of venues which will gives us an opportunity to see something of this exotic country. It will run from 3rd – 18th October.

It will be possible to be in Ulverstone from 12th to 15th September, see something of the beauties of Tasmania and still be able to join the international YLs in South Africa!!

What a great way to spend your time! I hope some of you will do just that.

The people to contact about South Africa are Janet ZS5JAN or Vee ZS6ZEN through Yahoo Groups. If you use Google it will find the site.

If there are other YL Meets the information will appear here in future months.

Do take the chance to meet other YL amateurs and enjoy the friendship. (Hint – the OMs seem to enjoy the Meets as much as the YLs)

Changes to our website

Unfortunately ALARA had a problem with the server for our website, as a consequence of which all our data was lost. Ben, harmonic of our energetic editor, Dot VK2DB, has spent hours and hours working to get the site up and running.

When it all happens it will be better than ever, with an email that will get all your wonderful news to me almost as soon as it happens, well, as soon as you write it out for me. Keep looking for the "new look" ALARA site!

A new Net for the VK3s

A VHF net on the VK3REC repeater, 147.175 will be run each Thursday evening from 8.00 pm local time.

We hope that some of the newest and some of the older (in terms of the length of time you have held your licence!!) YLs will join in.

We wish them luck. There is an active core group in this area so listen out if you can hear this repeater.

If you are an OM, you will also be welcome but the net is mainly for and to encourage the new YLs.

Did you participate in JOTA?

I am sure some of you will have assisted your local scout or guide group at JOTA this year but no-one has sent me any information or photos.

It would be very unusual for there not to be some YLs showing the flag for our share of the radio activity and I am certain you know who they are. Well done everyone who took their gear to the scout hall and helped the young people to "talk to the world". Even in these days of internet and VOIP it is still special to talk one to one to someone on the other side of the world, especially if you contact another scout group when you can compare notes.

Congratulations are in order

Meg VK5YG was persuaded to enter some photographs in her local Show. To her surprise (but not so surprising to her friends), Meg won two First prizes, three second prizes and three third prizes. Yes, there were a lot of other entries which did not win! When the YLs were told about her wins and shown the photos it was clear that her artist's eye had helped a great deal. Meg only took up painting and drawing on her retirement but she has shown much skill and has won quite a number of prizes in painting exhibitions but this was the first time with photos.

Well done Meg.

SEE YOU HERE IN THE NEW YEAR

AMSAT

Bill Magnussen VK3JT

Information – and how to find it

From time to time I am asked for clarification or expansion on some terms or acronyms that appear in the column. After all, how is a newcomer to know if they have a critical need for say a 'bias-tee' or a set of azimuth/elevation rotators and some auto-track software? What on earth is 10 GHz anyway?

In a column such as this it's a fine line to tread between boring the more experienced members of the satellite community with repeated explanations on the one hand and satisfying newcomers' thirst for knowledge on the other.

The whole amateur radio satellite field is awash with descriptive terms, technical jargon, acronyms, special interest groups, new and unfamiliar terminology. That is the nature of the beast and it is a situation by no means confined to amateur radio satellites.

Each new satellite launched, while having a lot in common with its siblings is nevertheless an entity in its own right. It might carry ground-breaking technology, or just different technology. It could have a whole sub-set of unique terms, modes, frequencies and timer-schedules.

To explain all these terms as you go along would fill several pages in each issue of the magazine.

As it turns out, it would also be quite unnecessary. To show how easy it is to re-invent the wheel, bore everyone to distraction and give yourself unnecessary work, let me illustrate.

Some 20+ years ago, I wrote a year-long series of monthly articles for AR magazine entitled *"Getting Started in Amateur Radio Satellites"*. It was not the first nor will it be the last such series to reach print.

Since that time, I have often been asked to upgrade the series and each time I have given it some thought. But when I have gone back and re-read the text with a view to an upgrade it struck me immediately how much the scene has changed, and a total rewrite would be necessary.

There are two things wrong with that idea. I just do not have the time or energy any more, and more importantly, it has been done already.

The same applies to including explanations each time a new term is used. It has been done before in publications that are available either in print or on the Internet. So let us look at a few resources that could be considered fundamental for anyone thinking of trying out satellite operation.

The internet is a wonderful resource but it can also be very frustrating. Web sites come and go. Unsubstantiated information is at best of doubtful value and often just plain wrong.

Web sites are only useful if they are maintained and that takes time and effort. After a disappointing search of various AMSAT organisations world-wide I had to admit that most informative links led back to the AMSAT-NA web site.

That is great from the point of "one-stop-shopping" but it does nothing for local flavour.

There are exceptions ,Tony Langdon's first-class site, http://www.vkradio.com/ is well worth a visit for an Australian perspective on the whole satellite scene. (Tony's name will reappear below). One of his efforts appears on the AMSAT-NA web site .

The AMSAT-ZL web site has a comprehensive list of frequencies and modes which can be printed out for a handy quick reference. European sites were disappointing as many are either outdated or just provide links to other sites. I found very little of interest to newcomers.

The American web sites and publications are quite different. Both beginners and experienced operators are well catered for with a variety of publications to fit every budget.

The fine ARRL publication, *The Radio Amateur's Satellite Handbook* by Martin Davidoff K2UBC has been mentioned many times before in this column.

This monumental work is a great source of practical, down-to-earth experience combined with all the necessary theory required to understand what is going on in this field. It is the first book I reach for even after 40+ years in satellites if I need clarification.

If you visit the AMSAT web site www.amsat.org and follow the prompts, you will come across a number of publications that answer just about every question a newcomer could have.

Getting Started with Amateur Satellites by Gould Smith WA4SXM is such a work It is similar in purpose to my 20 year-old effort in bringing the reality of satellite operations to newcomers.

Such a work has to tread a fine line between being comprehensive yet not being too off-putting and scaring people off with too much terminology, too quickly.

The reality is that the terminology needs to be mastered and that's where reliable,

The AMSAT group in Australia

The National Co-ordinator of AMSAT-VK is Graham Ratcliff VK5AGR. Contact Graham if you wish to be placed on a mailing list for breaking news and net reminders. As a forum for members AMSAT-VK operates two monthly nets.

AMSAT-Australia Echolink Net

The "Echolink" net meets on the second Sunday of each month. Anyone with an interest in Amateur Radio Satellites is welcome to join the net. Graham VK5AGR acts as net controller. The net starts at 0500 UTC during summer time periods and 0600 UTC during winter standard time periods. Connect to the AMSAT conference server on Echolink a few minutes before these times.

AMSAT-Australia HF net

The HF net meets informally on the second Sunday of each month. In winter (end of March until the end of October) the net meets on 3.685 MHz at 1000 UTC. In summer (end of October until end of March) the net meets on 7.068 MHz at 0900 UTC. Start listening 15 minutes before these times.

All communication regarding AMSAT-Australia matters can be addressed to:

AMSAT-VK
9 Homer Rd
Clarence Park SA 5034

Graham's e-mail address is:
vk5agr@amsat.org

authoritative reference material comes into the picture.

There are many other publications on the AMSAT-NA web site which are aimed at the newcomer, including one with a decided Australian flavour by our own Tony Langdon VK3JED.

Tony's contribution is entitled *"Working your first Amateur Satellite"*. Now there's a title sure to attract attention from beginners. Armed with the right selection of such works, the newcomer can find their way around the terms encountered. The outlay is nominal, most publications can be downloaded directly from the AMSAT site as PDF files and printed out to make up an excellent, cheap reference library.

They will stand you in good stead if you decide to climb up that steep "J"-curve of learning the art of amateur radio satellite communications – or even if after a brief try-out you are perhaps convinced that satellite operation is not for you, they will still be a valued addition to your amateur radio library.

Before the internet was so all pervasive, print media held sway. Information was passed around in newsletter format and via HF radio nets. The whole scene was simpler and everyone was a beginner.

John Branegan's (GM4IMH) heroic series of *"Satgens"* on packet radio ran from 1989 to 2001 when John was forced to finish at number 648 due to failing health. Satgens were eagerly awaited each week. They can still be Googled and are well worth bookmarking.

Graham Ratcliff's *AMSAT-Australia* printed newsletter ran for an amazing 180 monthly issues, that is **15** years of locally flavoured news for all levels!

It is difficult to keep up that level of commitment, in the face of dwindling general interest, waning membership and the rise of the internet.

My advice to newcomers is do not panic, help is available.

Assemble a real, printed library of material as noted above.

Seek advice on which sites are reputable. The internet is a good servant but a terrible master.

Finally – do not be afraid to put out some cash and buy one or two important publications. Martin's epistle comes immediately to mind.

The next few years, in particular 2009-10-11, promise to be bumper years for amsat-ers. They should see the launch of some long awaited high earth orbiting amateur radio satellites. That is certain to usher in a new phase of interest and spurt of activity similar to that which followed the 1983 launch of Oscar-10.

Most present day satellite operators will never have experienced a high earth orbiter. If you are a newcomer to satellites you have enough time to learn by doing on the low earth orbiters now available.

Give it your best shot and be ready for the renaissance of the next few years.

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Satgen321  In Orbit Pt5  The Sun       by GM4IHJ                    20 May 95

Recent satgens have considered satellites orbiting the earth, where it was
acceptable to ignore the mass of the satellite, and the effects due to
other bodies. When a satellite orbits far from earth , or, we consider the
orbit of a planet or moon, these short cuts are no longer permissable.
For this reason therefore the calculation of the orbit takes a somewhat
different form from the solution of NASA 2 line Keplerian elements used
for near earth satellites. The mathematics employs a roughly similar
format but Ephemeris data replaces NASA 2 line elements.

Equally important . When we get away from the earth , orbit periods become
months and years , not minutes. This becomes obvious when we start with
the Epoch time of the Ephemeris data. Because of the long time periods
involved it is common practice to set the Epoch at some cardinal point in
time Eg noon 1 Jan 1900 or , noon 1 Jan 2000. Orbits in deep space do not
suffer from the spasmodic drag factors present in low earth orbits so
predictions can be kept reasonably accurate over many years, with even the
perturbation due to the big planets Jupiter and Saturn being amenable to
simple correction. So if your software has Ephemeris data for Epoch noon 1
Jan 2000 it should be good , unchanged, for the next half century

Typical Ephemeris Data  - for the Earth orbit around the Sun

Epoch 1900 Jan 0.5  = noon 1st January 1900  (julian days start at noon.....
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A typical clip from the Satgens series by GM4IHJ (SK)

A new class of amateur radio satellite

During the earliest days of AMSAT, the various classes of amateur radio satellites were still being defined.

Terms like Low-Earth-Orbit (LEO) etc. came into being almost overnight. Back then the prospect of a High-Earth-Orbiter (HEO) was not even on the wish list.

The early beacon-only satellites were called Phase-1. The next "phase" to come along were LEOs with transponders and a degree of control. They were classified Phase-2. As the HEOs came to reality this stage was referred to as Phase-3.

To complete the overall classification system two more were added .

They were definitely in the "dream" category. Phase-4 or geo-stationary/ geo-synchronous was the first to be envisaged. Lack of funding caused these plans to be shelved back in the 90s. Karl Meinzer and his "dream-team" then came along with the concept of Phase-5, a satellite which would break free of Earth's gravity and head off to Mars with lots of scientific stuff on board.

So there we had it, Phase-1 to Phase-5. The cycle was complete. The AMSAT-DL team have made remarkable progress with P5A but the dream of a Phase-4 geo-bird was still way down the list.

Not any more. Things have been happening. Rick Hambly W2GPS, AMSAT President, along with Bob McGwier N4HY, AMSAT Vice-President of Engineering, recently made public the results of some behind-the-scenes negotiations.

AMSAT has been in consultation with Intelsat regarding an application of an Intelsat platform carrying our amateur radio satellites into geosynchronous orbit. Phase-4 may yet live!

Engineering studies, funding studies and other negotiations are continuing at this point. Nothing is set in concrete as yet, but according to Bob *There is enough in place at this time that AMSAT needs to begin planning engineering work and possible construction of a geosychronous payload so we are ready if Intelsat says they have a ride for us.*

More on this exciting new project next month. It promises to be a hot topic in the meantime. Questions like *How many such satellites*? and *Where will they (it) be placed*? will surely be early ones to be considered.

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DX – News & Views

John Bazley VK4OQ
P.O. Box 7665, Toowoomba Mail Centre, QLD 4352, email john.bazley@bigpond.com

Looking back I see it was in November 2005 when I commented on "the on-line logs" and the giant steps taken by the KH7 Kure Island DXpedition. I am, of course, referring to the huge amount of data available to amateurs working the Kure DXpedition. They had problems, but as I stated in November 2005 these will be solved and this type of facility is here to stay. Well it has taken two years to surface again, this time with some original improvements. I am referring of course to the recent 3B7C operation and their 'on-line log'. The 'Green Squares' of KH7 were replaced by 'Red Squares'. Confirmation of a QSO being indicated by a white 'tick' in the appropriate band/mode square. Clicking on this Square displayed the operator at the time of your contact! But that is not all.

A superb addition to the log data was available by clicking on your CQ zone number. Immediately you had displayed the number of QSOs already in the 3B7 log from your Zone, analysed band by band and the time of the maximum number of contacts. If you were missing a band, instantly you could see when the majority of amateurs in your zone had worked the 3B7. This is an excellent refinement and the team are to be congratulated on this addition. Congratulations are also due to the VKs who 'topped' the list in Zone 29 –VK6HD and for Zone 30 – VK3GK.

So what is happening on the DX front?

FH. FH1LE is the new callsign for F4RPW, Alain, now that he lives fulltime on Mayotte. He has been there for three weeks and is getting his gear sorted out. He hopes to have the station operational this week. He will start out with a 4BTV vertical and his FT-897 rig running 100 watts. He will be on SSB and maybe CW if he can get in a little practice. He also plans to get on PSK31 and RTTY with a Microham interface box. And, he has a KT-34 beam, the latest upgrade, but has to work out some issues with the small space he has to work with at his QTH.

VK9W. On their return from the VK9WWI, Willis Island "North Cay" DXpedition, Allan VK2GR was fortunate to have lunch with Tomi HA5RY and George AA7JV. During the boat trip out from Sydney, George said that they had to stop at Mackay for engine repairs and provisioning, which resulted in further logistical issues to get Tomi and the equipment down from Cairns.

On Willis Island they used an 160 m inverted L antenna at water level with elevated radials, several of which were lost with the changing tide. This antenna was used for all bands with an automatic antenna tuner. For reception on 160 m they used a Pennant, a 200 m long Beverage and pre-amp together with filters to reduce QRM from strong, relatively local signals. The QSO count during the 10 days of activity was 10,834 with 1,211 of these being on 160 m. Allan said that Tomi and George may be back in this area for another 'rare one '(Mellish Reef?). Many thanks for the email, Allan.

(Editor: See the article in this issue.)

3D2 Rotuma. Tony 3D2AG/FO5RK reports that his trip to Rotuma is now scheduled from 15 December to 20 January. He will be active on 10-80 metres SSB and CW, plus digital modes if local power conditions allow him to use a computer. Tony will use Spiderbeam antennas, solar panel and/or a generator and no linear amplifier. QSL direct to 3D2AG or FO5RK (see qrz.com). Updates will be available at http://www.3d2ag.fr.tc/

C9. Rodrigo CT1BXT will be active as C91R from Mozambique until August 2008. His preferred mode is RTTY. For the time being he is active on 20 metres with 100 watts and a dipole, but he hopes to put up a five band beam for 10, 12, 15, 17 and 20 m. QSL via home call.

J5. A number of ops, mostly from the January 2007 XT2C DXpedition team, will be QRV from Guinea-Bissau this coming January. They will activate J5C from Bubaque Island (AF-020) from January 10th to 21st. Team members include F4AJQ, F6AML, F5JSD, F5VHQ, F8BJI, F9IE, F2VX, F2JD, F8BUI, F4TTR, F5PED, F5TVG, N2WB, N6OX and OE8KOK. Plans are to have five stations, with four amplifiers QRV 24 hours a day. Activity is expected on all bands on CW, SSB, digital modes and SSTV plus 29 MHz FM. They will be using verticals on 80 and 160 metres and beams on the other bands. QSL this operation via F5TVG.

T30. Toshi T30XX (JA8BMK) left Tarawa, West Kiribati and is back in Fiji and QRV as 3D2WW for a few days before heading back home to Japan. Apparently his amplifier broke and Toshi was unable to fix it or have the company send him a new amp. He plans to go back to West Kiribati and then go on to Central Kiribati (T31) in December 2007 or January 2008, says Ken JA8CDG. Toshi will also take a new 160 metre antenna with him to T30 and T31. QSL both T30XX and 3D2WW via JA8UWT.

PZ. The 4M5DX Group is organizing a DXpedition to Suriname, to take place in the first half of January 2008. A multinational team of skilled and experienced operators is being gathered and plans are to have three stations active for 10 days. They will operate, as PZ5YV, on all bands (160-6 metres) CW, SSB and RTTY. Team members will be: Olli OH0XX, Spiros SV8CS, Pedro HK1X, Alex YV5SSB, Ramon XE1KK, José YV5TX, Diego LU8ATX, Pasquale YV5KAJ, and Ramon PZ5RA. Financial assistance is requested to offset the costs: for further information, please visit: http://pz5yv.4m5dx.org/ Full colour QSL (direct or bureau) via IT9DAA.

9Q. Democratic Republic of Congo: John SM5DJZ is the new QSL manager of 9Q1TB and 9Q1EK, after their last manager SM5DQC passed away. Direct QSLs should be sent to: Jan Hallenberg, Vassunda Andersberg, SE-741 91 Knivsta, Sweden. The logs will still be uploaded to the LotW and online logs are still available at: http://www.logsearch.de

As the year draws to a closewe hope we can look forward to better conditions in 2008!! So Happy Christmas and New Year – Happy DXing!

Special thanks to the authors of The Daily DX (W3UR, 425 DX News (I1JQJ) and Allan VK2GR for information appearing in this months DX News & Views.

You can obtain from W3UR a free two week trial of The Daily DX from www.dailydx.com/order.htm

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Season's felicitations to one and all!

Welcome to this month's Contest Column!

Contests

VK4BAA Phil Smeaton

Contest Calendar December – February 2007/2008

Dec	1	RTTY Melee	RTTY
	8	ARRL 10 metres Contest	CW/SSB
	22/23	OK DX RTTY Contest	RTTY
	26 to 13 Jan 2008	Ross Hull Memorial VHF Contest (VHF/UHF)	CW/SSB/FM
Jan	5/6	ARRL RTTY Roundup	RTTY
	12/13	Summer VHF/UHF Field Day	CW/SSB/FM
	26/27	BARTG RTTY Sprint	RTTY
	26/27	REF Contest	CW
	26/27	UBA DX Contest	SSB
Feb	9/10	CQWW RTTY WPX	RTTY
	16/17	ARRL International DX Contest	CW
	23/24	REF Contest	SSB
	23/24	UBA DX Contest	CW
	23/24	CQWW 160 m Contest	SSB

CQWW CW 2007

At I write this, preparations are underway in the BAA household, not for Christmas, but for the CQWW CW contest.

Mother Nature has been harsh again, seemingly increasing gravity around my ailing loop on 40m and weakening the trees around the house so as to cause the 160m dipole to come crashing down along with the loop's main support.But, as they say, when the going gets tough, the tough get going – and that's exactly what's planned for the 'BAA household as the thought of stringing all that wire back into the trees only to have it tossed onto the floor again simply doesn't appeal at the moment.

So instead, we're off to ZL for the CQWW CW Contest to the QTH of Gary ZL2IFB, an old friend from Blighty. With ZL6QH still off air due to having the builders in, Gary was at a loose end for the contest. A few emails later, arrangements are formed to allow a girly shopping trip for partners whilst Gary and I do the contest as two single band single operator entries.

A lesson learnt long ago, was to make arrangements for 'the other half' whilst radio fun was being had, else the 'brownie points' pixie runs away with all the goodies and leaves the unsuspecting contester in the lurch when the next contest comes along.

CQWW SSB 2007

The SSB leg of CQWW was at Andy VK4HAM's QTH using Trent's VK4TI callsign as a multi-single entry, with Trent, Andy, Dave VK4NDX and myself.

Andy's tolerant wife made a bee-line for the exit over most of the weekend, leaving strict instructions along the lines of: "All these wires and things WILL be gone soon, won't they?"

Andy, an insurance professional, didn't need a crystal ball to gauge the future if compliance wasn't absolute. He sagely smiled and said "Of course" - a wise man indeed. Andy's life insurance policy rests safely for a little while longer.

Photo 1 shows Trent VK4TI in action during the contest, doing his best to log fast and accurately as well as manage the pile-up of stations calling. Pile-up management is an acquired skill honed over time to cope with the many callers – some of whom are significantly less disciplined than others.

Suburban back yards are not always the best for multi-transmitter contesting as the antennas are positioned close to each other and cause inter-band troubles. This occasion was no exception, with assistance rendered by Alan VK4SN with a loan of the coaxial stubs made for the VK4WIL get-together for the Oceania DX contest a few weeks prior.

Alan's skills were put to the test and were faultless, with the stubs diminishing the inter-station hash considerably. We had all manner of equipment failures: with PCs getting upset with legal limit RF levels and Trent's amplifier spitting the dummy after a few hours.

The station was effectively a single-operator entry from then, as the multiplier station was not used concurrently with the run station. Additionally, with TVI problems on the LF bands, we were left to concentrate on 10 m, 15 m and 20 m only for the contest. 10 m proved to be something of a surprise as the band opened to JA and UA0 at the beginning of the contest and resulted in well over 200 Japanese callsigns being logged within the first hour. The opening lasted for a number of highly productive hours after which, I was lured from the operating chair by our illustrious host offering beer, as he wanted to operate. 10 m however had other thoughts and died immediately – at least that's what Andy claimed. A quick QSY to 15 m had the log being heavily populated again in fine fashion.

Sunday was harder work than Saturday, with band conditions changing for the worse in VK4 at least and Murphy visiting the equipment.We finished with around 1600 QSOs and just under

1 million points, so the record books remain untouched from our efforts at least. However, we had some fun and made plans for future endeavours during 2008.

Contesting - Is your software up to the challenge?

With CQ WW CW approaching, it is worth trying these quick tests with the software you use:

Enter a callsign, say VK4BAA, into the callsign field and press "Enter" (or Insert or F5 or F5+F2 according to your software requirements) to start the callsign (or call + exchange) sending process.

1. Hit 'escape' (or whatever abort sending key your software specifies). Does the sending stop *instantly* i.e. not after a buffer has emptied?
2. During sending, you notice the typo or copying error - correct the last letter 'A' (before the software has reached that part of the callsign) to B. Is the callsign now resent correctly?

If the answer is 'NO' to either question, then maybe you should consider a change to better software which will increase speed and efficiency when handling a pile-up of callers. A simple test, but an effective one none-the-less.

2007 Round-Up

The last year has been an interesting time for contesting. It is my anniversary as your humble scribe in November, and 2007 has been memorable as the arguable bottom of the sun spot cycle. Some think 2006 was the bottom whilst others think we've only just arrived.

Whichever view you hold, 2007 has certainly been focussed towards the LF bands with a more myopic eye on HF from time to time. CQWW tends to bring the bands alive when you least expect it, adding credence to the view that 10 m is often open but nobody is there to take full advantage of it.

The VK Contest Club (VKCC) has blossomed from its humble beginnings in 2004, towards a national contesting orientated group for VK licence holders across the country. VKCC members (it is utterly free, by the way) have been active in national and international contests throughout the year and have taken full advantage of using the VKCC forum to discuss topics of interest and to meet friends both old and new.

Home grown contests have seen a healthy participation increase generally with the bands alive with VK calls during RD, Field Days, John Moyle and the like. F calls are no exception to this, with many taking part in contests for the first time in 2007 and reportedly loving it.

The Oceania Contest and the Commonwealth Contest (aka Beru) continue to put VK on the world stage, allowing VK to be the focus of the world for a period. Many rotators in the northern hemisphere crept into virtually unknown territory and beamed long or short path to VK to get those elusive callsigns into the log. Next year will see a continuation of the Beru approach for country teams competing for dominance over the other areas of the now somewhat diminished British Empire.

It's my humble opinion that contesting in VK is coming along nicely: it's vibrant and healthy; it continues to attract increasing domestic and international participation and continues to enhance the VK profile globally. There are areas for improvement. The simplification/ clarification of the rules for some contests, or even the introduction of a Region 3 Field Day contest suite similar to that now enjoyed by stations in Region 1 might be considered as focus areas.

A shopping list for Santa

Top of my list for Santa has got to be a jumbo-sized box of sun spots. Next, would be a QRM removal button that removes people who think they can just call CQ anywhere they like on a band without the courtesy of listening first to the frequency for potential occupancy.

I'd like to see single letter suffixes for VK calls that allow contesters to close the competitive gap on our brethren overseas, in addition to contest specific power limit enhancements for the same reason. The latter two items seem to be emotive issues that often raise the cry of elitism by the few in the name of the many. It appears to me that because some people don't want a particular facility, they work hard to stop others from having it. Work in progress, definitely, but I'm not holding my breath!

For the 'BAA household, well, me at least, the biggest item on the list is for a QTH of our own in 2008 so that we can finally put down some roots and start to think about that big tower that I've always had a hankering for. I wonder how big Santa's sleigh is....?

That's all for 2007

I wish you and your loved ones the very best for 2008. Stay healthy, stay safe and have a tune around the bands when a contest is in full swing. You never know, you might just give it a try and get bitten by the contesting bug. Maybe start the New Year off with participating in the Ross Hull Memorial VHF Contest and take it from there. May you multiply often and produce a huge log!

If you have any contest related material for inclusion within the column, topics that you'd like covered or even some experiences and pictures you'd like to share, then please feel free to get in touch via vk2baa@wia.org.au. See you on the bands.

73 de VK4BAA Phil Smeaton

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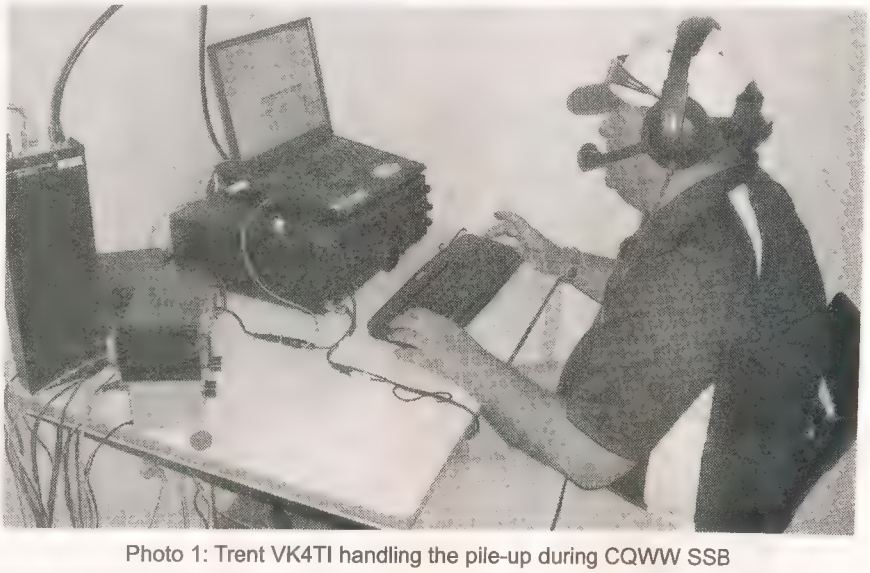


Photo 1: Trent VK4TI handling the pile-up during CQWW SSB

Ross Hull Memorial VHF-UHF Contest 2007 - 2008

John Martin VK3KWA, Contest Manager

The next Ross Hull Contest will run from December 26 to January 13. Logs will be due by February 4.

The annual Summer VHF-UHF Field Day will be held over the closing weekend of the Ross Hull Contest. Field Day contacts may be included in your Ross Hull log, provided each station you work appears in your log only once per band per day.

There has been a relaxation of the rules on serial number exchanges for contacts made using M/S or short-lived Es openings: callsigns plus two other digits will be accepted for contest purposes.

The Contest

The WIA maintains a perpetual trophy in honour of the late Ross A. Hull and his pioneering achievements in VHF and UHF operation. The name of each year's contest winner is engraved on the trophy, and other awards may be made in the various divisions of the contest. The contest is open to all amateurs.

Duration

0000 UTC Sunday 26 December 2006
to
2400 UTC Sunday 13 January 2007.

In Eastern Summer Time, that is 11 a.m. on December 26 to 11 a.m. on January 14.

Sections

A: VHF - UHF (50 MHz through to 1296 MHz), non-digital modes.

B: Microwaves (1296 MHz and above), non-digital modes.

C: Digital Modes, all bands.

Digital modes are defined as those in which the decoding of the received signal is done by a computer. Entrants may submit logs for one or more sections.

General Rules

One callsign and one operator per station. You may claim one contact per station per band per UTC day. Repeater, satellite and crossband contacts are not permitted. No contest activity is permitted below 50.150 MHz. In Sections A and B, entrants making contact on recognised DX calling frequencies should not occupy these frequencies for prolonged periods. All rulings of the contest manager will be accepted as final.

Valid Contacts

For Sections A and B, entrants must exchange RS (or RST) reports plus a serial number. Serial numbers need not be consecutive. For propagation modes such as meteor scatter or short-lived sporadic E openings, exchange of callsigns plus two further digits is sufficient. For Section C, exchange callsigns plus two further digits that cannot be predicted by the other station.

Scoring

Scoring will be based on the best seven (7) UTC days nominated by the entrant. Each contact will be scored as follows:

For 2 metres and above, one point per 100 km or part thereof (i.e. up to 99 km: 1 point, 100 - 199 km: 2 points, etc).

For 6 metres only, contacts below 1000 km: as above. Contacts from 1000 km to 2400 km, 2 points regardless of distance. Contacts over 2400 km, 20 points regardless of distance.

The band multipliers are:

6 m	2 m	70 cm	23 cm	Higher
x 1	x 3	x 5	x 8	x 10

Logs

Logs must cover the full contest period and contain the following for each contact:

- Date and UTC time.
- Station location (if operating portable).
- Frequency and callsign of station worked.
- Reports and serial numbers sent and received.
- Approximate location or grid locator of station worked.
- Estimated distance worked and points claimed, including the band multiplier.

Separate scoring columns for each band would be helpful.

Cover Sheet

Logs must be supplied with a cover sheet containing:

- Operator's callsign, name and address.
- Station location (if different from the postal address).
- Section(s) entered, and a list of the UTC days to be scored.
- A scoring table set out as the example below.
- A signed declaration that the station has been operated in accordance with the rules and spirit of the contest, and that the contest manager's ruling will be accepted as final.

Please use the following format for your scoring table. If you wish you can cross-check by adding the daily totals across the table, but please make sure that you include the separate band totals.

Date	6 m	2 m	70 cm	23 cm	etc
	---	---	---	---	---
Day 1	xxx	xxx	xxx	xxx	xxx
Day 2	xxx	xxx	xxx	xxx	xxx
etc.					
	---	---	---	---	---
Total	xxx	+ xxx	+ xxx	+ xxx	+ xxx

= xxx (GRAND TOTAL)

A sample cover sheet and scoring table has been included in the postings on WIA web sites and the VK-VHF e-mail reflector. Copies can also be obtained from the email address given below.

Penalties

Minor errors in distance estimates or calculations may be corrected and the score adjusted. Prolonged use of recognised DX calling frequencies (especially when the reports indicate strong signals) may incur a scoring penalty. Inclusion of any false log entries will lead to disqualification.

Entries

Paper logs may be posted to the Manager, Ross Hull Contest, 3 Vernal Avenue, Mitcham, Vic 3132. Electronic logs can be e-mailed to vhf-contests@wia.org.au The following log formats are acceptable: ASCII text, Office 97 or Office 2000 RTF, DOC, XLS or MDB.

Logs must be received by Monday 4 February 2008. Early logs would be appreciated.

Note on Calculating Distances

Absolute accuracy is not required. You just need to know whether each station is above or below the nearest multiple of 100 km, so you can use a compass to draw 100 km circles around your location on a map. A more accurate method is to use six-digit Maidenhead locators and a computer program that can be obtained by emailing the address given above. (The program has been updated to version 3.)

Summer VHF-UHF Field Day 2008

John Martin VK3KWA, Contest Manager

The SUMMER VHF-UHF Field Day will be held over the weekend of January 12 and 13. The rules are very little changed from last year. Please note two rule changes that were first adopted for the Spring VHF-UHF Field Day in November 2007:

1. Stations may enter both the 24 hour and 8 hour sections, but only if the station actually operates for more than 8 hours.
2. Changing locations: It is not in the spirit of the contest for grid-hoppers to set up more than one station and move between them. The rules now make it clear that not only the operator but also the station must be moved when operating locations are changed.

Please note also the rule on the use of DX calling frequencies. Where possible, contest activity should focus on the recommended contest calling frequency.

Dates

Saturday and Sunday January 12 and 13, 2008.

Duration in all call areas other than VK6: 0100 UTC Saturday to 0100 UTC Sunday.

Duration VK6 only: 0400 UTC Saturday to 0400 UTC Sunday.

Sections

A: Portable station, single operator, 24 hours.

B: Portable station, single operator, 8 hours.

C: Portable station, multiple operator, 24 hours.

D: Portable station, multiple operator, 8 hours.

E: Home station, 24 hours.

If a single operator station operates for more than 8 hours, the station may enter both Section A and Section B. If the winner of Section A has also entered Section B, his log will be excluded from Section B. The same applies to multiple operator stations entering Sections C and D.

General Rules

A station is portable only if all of its equipment is transported to a place which is not the normal location of any amateur station. Operation may be from any location. Stations may change location during the Field Day provided the station is dismantled and reassembled each time it moves. You may work stations within your own locator square. Repeater, satellite and crossband contacts are not permitted.

One callsign per station. If two operators set up a joint station with shared equipment, they may choose to enter Section A or B as separate stations under their own callsigns, or Section C or D under a single callsign. If they enter Section A or B, they may not claim contacts with each other. Stations with more than two operators must enter Section C or D. Operators of stations in Section C or D may not make contest exchanges using callsigns other than the club or group callsign.

No contest operation is allowed below 50.150 MHz. Recognised DX calling frequencies must not be used for any contest activity. Suggested procedure is to call on .150 on each band, and QSY up if necessary.

Contest Exchange

RS (or RST) reports, a serial number, and your four digit Maidenhead locator.

Repeat Contacts

Stations may be worked again on each band after three hours. If the station is moved to a new location in a different locator square, repeat contacts may be made immediately. If the station moves back into the previous locator square, the three hour limit still applies to stations worked from that square.

Scoring

For each band, score 10 points for each locator square in which your station operates, plus 10 points for each locator square worked, plus 1 point per contact. Multiply the total by the band multiplier as follows:

6 m	2 m	70 cm	23 cm	Higher
x 1	x 3	x 5	x 8	x 10

Then total the scores for all bands.

Logs

Logs should cover the entire operating period and include the following for each contact: UTC time, frequency, station worked, serial numbers and locator numbers exchanged, points claimed.

Cover Sheet

The cover sheet should contain the names and callsigns of all operators; postal address; station location and Maidenhead locator; the section(s) entered; the scoring table; and a signed declaration that the contest manager's decision will be accepted as final.

Please use the following format for your scoring table. In this example the operator has operated from one locator and worked four locators on each band:

Band	Locators Activated	+	Locators Worked	+	QSOs	x	Multi plier	=	Band Total
	(10 points each)		(1 point each)						
6 m	10	+	40	+	40	x	1	=	90
2 m	10	+	40	+	30	x	3	=	240
70 cm	10	+	40	+	20	x	5	=	350
Overall Total								=	680

A sample cover sheet and scoring table is available on the WIA web site. Copies can also be obtained from the e-mail address given below.

Entries

Paper logs may be posted to the Manager, VHF-UHF Field Day, 3 Vernal Avenue, Mitcham, Vic 3132. Electronic logs can be e-mailed to vhf-contests@wia.org.au The following log formats are acceptable: ASCII text, MS Office 2000 (or earlier) RTF, DOC, XLS or MDB.

Logs must be received by Monday, January 28, 2008. Early logs would be appreciated.

nr

David Smith VK3HZ – vk3hz@wia.org.au

Weak Signal

David Smith VK3HZ

On 11th November, a large high-pressure cell moved into the Bight causing excellent conditions across the south of the country.

On the morning of the 11th, Brian VK5BC and Phil VK5AKK both reported hearing the VK6RST 2 m and 70 cm beacons on Mt Barker near Albany. As per usual, the 70 cm beacon was a lot stronger than the 2 m one, due to the higher power and directional aerials used on 70 cm. Rob VK6JRC, who had just moved to the south coast of WA was watching the reports on the VK/ZL Logger with interest. He takes up the story:

"I only moved the Thursday before to my new QTH at Denmark - approx 50 km west of Albany in WA.

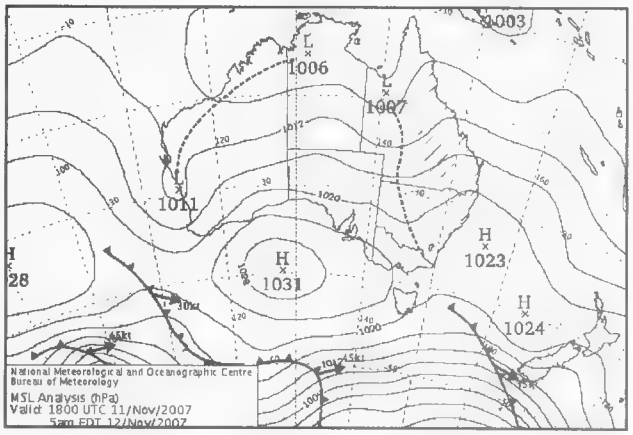
I had seen the Hepburn charts on Friday and commented to others over here that the conditions could be good on the Sunday.

The day was spent unpacking moving boxes and some work out in the garden. I checked my e-mails around lunchtime and saw that stations in Albany & Bunbury had received the WIA News Broadcast via the 146.900 MHz Mt Gambier repeater. VK Logger also had stations receiving the Mt Barker (WA) beacons, about 50 km north of me.

In the afternoon I had to make a trip to the hardware store to pick up some supplies. On the way out I noticed my portable 2-element Moxon antenna on top of a box in the carport. On the spur of the moment, I picked it up and put it in the car, deciding that I would detour via the beachfront car park on the way to the hardware store to see if there was any propagation about on 2 metres.

To my surprise, I could hear the Mt Gambier beacon (144.550) at 4x1 with the antenna on the ground, which came up to about 5x2 with the antenna at head height. I also spoke to a couple of locals on the Albany repeater who had been working into repeaters in VK5 and VK5s had been working into the Albany repeater.

In the true spirit of amateur radio, I put the trip to the hardware store on the backburner and headed straight back home and found my IC-910 and power supply in the removalist box. I also found my 8-element 2 m Yagi and 11-element 70 cm Yagi in the carport and a 6-foot length of aluminium tubing to use as a mast. The only thing I could not find was my coax cable, but rummaged through a box and found several RG58 coax patch leads as well as several coax adaptors to make up a 3 or 4 metre cable!



Fortunately, the house we have moved to is 2 storeys, with a balcony on the top floor and a not too bad take off to the east.

The 2 m Yagi was set up attached to the pipe and tied to the balcony rail. The 70 cm Yagi had to sit on the balcony rail, as I did not have another set of clamps and only a 1 m long patch lead. The IC-910 was setup on a cardboard removalist box with a deck chair on the balcony. It was definitely a very temporary (and portable setup).

The power was switched on and I tuned into VK5RSE on 144.550 (5x3) and 432.550 (4x1). I then put out a call on 144.100 MHz and made my first contact with VK5AKK. After that, I had a pileup to work and unfortunately I did not have a logbook handy to record all of the contacts.

Other stations contacted throughout the afternoon and evening in no particular order included:

VK5BC, VK5NY (5x9+ on 2 m) also worked on 70 cm, VK5DK, VK3AXH, VK3AAK, VK3HZ (Also worked on 70 cm 5x1 - 2500km on a handheld Yagi!), VK3II, VK3KAQ and VK3KSD.

There may have been others, so please accept my apologies if I have missed anyone, but my logbook keeping is shocking!

Many stations are keen to try and work me on 23 cm. I do have the 23 cm module in the IC-910 and a 60 watt VK3XPD amplifier, but still need to arrange an antenna and get everything operational.

I hope to have some antennas for 2 m & 70 cm at least up in the next couple of months. It will not be anything too large as I am living in a house supplied by my employer and I have to tread a little carefully with the landlord!"

So, it was a very warm welcome to the south, and VHF DX, for Rob. It's good to see some more stations active in southern VK6.

All this was happening on the evening of 11th November. While Rob was busy, others were also having fun. Bob VK6BE in Albany managed to work to VK3AAK, VK3II, VK5BC, VK5DK and VK5AKK.

Meanwhile, the eastern end of the duct appeared to be moving to the south. Adelaide stations were working into Tasmania with VK5BC working VK7LCW at 1100Z. However, barely an hour later, the Adelaide stations were barely above normal levels in Melbourne, while the VK3 to VK7 path was very good. Karl VK7HDX reported that, at 1310 Z, he heard the VK6RST 2 m beacon – a distance of 2677 km. However, despite much calling, no contact was made.

The following morning brought more good conditions. Peter VK5ZLX reported hearing the VK3RGI 2 m beacon in the Latrobe Valley, and the VK7RAE 2 m beacon in northern Tasmania. The VK6RST beacons were still strong into Melbourne and beyond. The duct at the VK6 end appeared to have extended further west, with the Perth repeaters being heard in VK5 and VK3. The Hepburn chart clearly shows the duct running almost directly from southern VK6 to southern VK3.

At 2045 Z, Wayne VK6JR in Yallingup on the western tip of southern WA worked into Adelaide to Phil VK5AKK (5x4) and Roger VK5NY (5x2). Roger's signal later got to 5x9. Don VK6HK in Perth reported hearing the VK5RSE Mt Gambier 2 m beacon at 5x3.

The duct then worked its way into VK3. At 2200 Z, VK6JR worked Trevor VK3VG in central Victoria (5x1). He also worked Andrew VK3KAQ in the Dandenong Ranges to the east of Melbourne – a distance of 2764 km. Wayne was having power supply problems, so could only muster 10 watts. Hence, he only received a 3x1 from Andrew, but returned a 5x1.

Bob VK6BE had re-appeared. He worked VK3VG, VK3II, VK3AAK, VK5BC and VK5ZK. Wally VK6WG in Albany also popped up and worked Phil VK5AKK and Brian VK5BC on 2 m and 70 cm. An attempt with Phil on 23 cm was unsuccessful. Wally also worked Andrew VK3KAQ on 70 cm. Wally's signal on 70 cm was still well over S9 in Adelaide an hour later. At 0444 Z, Colin VK5DK reported working Wally on 70 cm with a 5x7 report. However, by that evening, the duct had moved on.

Spring VHF/UHF Field Day

The Spring VHF/UHF Field Day has just finished and it was pleasing to hear many stations out in the field. Ron VK4KDD reports:

"I was portable in Byron Bay (top of NSW) at a site with excellent take off to the north and south – and a view to kill for!

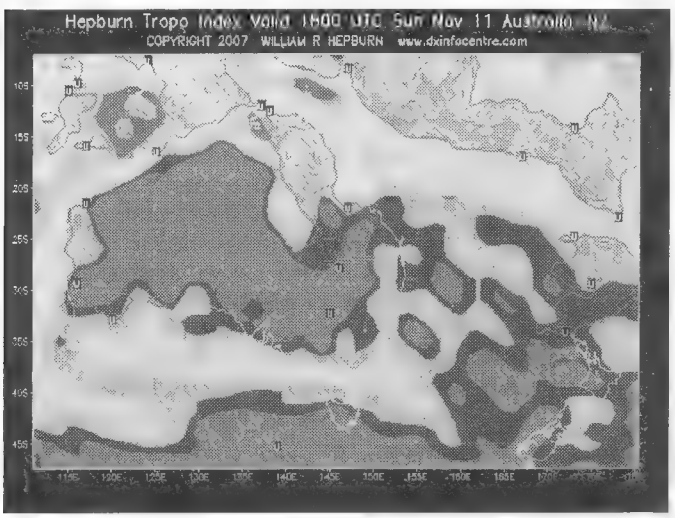
Had a slow start - missed the first 2 hours of the contest, and later had to move antennas because of interference from a commercial transmitter site. But when all the lessons were learned, it went smoothly and the station performed very well.

I managed 55 contacts (SSB only) on 2 m, 70 cm and 23 cm. All contacts were tropo - could not see much aircraft going on. Signals were there pretty much all the time.

On 23 cm, there was quite a bit of activity. I worked Steve VK2ZT (500 km) and about 4 other VK2 stations, into Toowoomba, and also VK4EME close to Gympie. The antenna is only a single 17-element Yagi, which sounds big, but is only 1.3 m long.

70 cm was doing better than expected, with mostly better signals than 2 m. This was not so strange because I had 6 dB more antenna gain, with the same 400 W as on 2 m.

Ended the contest after an 18-hour day - 4.5 hours in the car (380 km), 2 hours setting up site, 1.5 hour packing and 10 hours for the contest."



Ron also mentioned that, during the contest, Glenn VK4BG worked Norm VK3DUT – a distance of 1467 km. Glenn also heard several other southern stations – VK3ACC, VK2FZ and VK1BG – in what may have been a burst of Sporadic E.

One disappointing aspect of the contest was the operating procedures employed by some of the stations. The general trend seems to be the use of a contest calling frequency of 150 on each band. While this is fair enough, and the way the VHF/UHF bands operate during non-contest times, it can be seen as the lazy person's way of contesting – merely prop on the frequency and wait for someone else to call. And as for most calling frequencies, the concept can be easily ruined if people do not move off that frequency to continue their QSO. Many times, strong local stations would take up residence on 144.150 and have a long drawn-out series of contacts, blocking the frequency for others. This is particularly annoying for stations perched on distant hilltops, as they often cannot hear the call frequency hogs, and their weak calls go unheeded.

So, if you must use the "calling frequency" method, please QSY as soon as you establish contact with another station. It would be fair for other stations to give a "reminder" to those not following this practice. Also be aware that the bands do not finish at 200. Spread out to minimise interference to other locals – there is plenty of space. Only 6 m is limited to operation above 50.150. On all other bands, there is only a "recommendation" to stay above 150, but operation below 150 (except for the DX call frequency - 100) and above 200 is permitted.

Ultimately, we should all start using our VFOs to good effect. Find yourself a frequency – 5 kHz increments work too – and call CQ. If the majority start operating in this manner, then we should all get higher scores and those distant stations will get more business – providing you swing your beam in their direction, but that's another challenge.

1296 Operations

Barry VK3BJM near Kyneton reports some success in his attempts to work into Canberra on 23 cm:

"I have completed the 2 x RA18H1213G PA that Chas VK3PY has designed, and it is now fitted to my transverter and making about 60 W on 1296 MHz.

This Monday morning (at 2237 Z 7/10/07), I first worked Ian VK1BG then Chris VK2DO on 1296.150 MHz, at our first attempt. Surprising how good signals were; my initial RS exchange with Ian was 51 both ways, with amendments to 53. I sent Chris a 51 (with QSB - the aircraft was moving away by then) and received a 53. I was also heard by Rob VK1ZQR, apparently, who called me but was not picked out by myself at the time (Rob is running a little less power than Ian or Chris).

All this on the first attempt, and a single aircraft pass, to boot! Looking forward to getting the pre-amp up to the masthead, and seeing how much better that makes things. Only running a single 39-element DL6WU Yagi at present; like to improve on that in the future."

Beacons

Tim VK2XTT – BMARC President - reports some good news about new beacon construction:

"The Blue Mountains Amateur Radio club is in the process of constructing beacons for 2 m, 70 cm, 23 cm and 13 cm. The beacons will share a common GPS-locked frequency standard and broadcast 1 pps CW to stand out from all the RFI carriers.

The primary, GPS-locked, 10 MHz oscillator has been constructed and is awaiting tests. A prototype beacon controller has been constructed and is currently being tested. The 13 cm beacon is partially constructed - PA back to first tripler - and is awaiting tests. Parts for 2 and 70 have been acquired.

With a little luck we might have a beacon or two on air by Christmas."

Please send any Weak Signal reports to David VK3HZ at vk3hz@wia.org.au.

Digital DX Modes

Rex Moncur VK7MO

Welcome to Paul VK4APN, who is operational on 2 metres Meteor Scatter with FSK441 from Cairns in North Queensland. To date, pings have been copied from Paul by Wayne VK4WS in Brisbane, John VK4JMC in Laidley and Steve VK2ZT in Newcastle (1880 km). While a QSO is still to be completed, this is a good start and it is great to have a station operational in Far-North Queensland on meteor scatter.

Welcome also to Peter VK3TPR in Melbourne who is operational on JT65a on 2 metres. Peter has a good signal into Hobart peaking -15 dB.

Rex VK7MO, Justin VK7TW and Ken VK7DY have been experimenting with light (474 THz) using JT65a with a 36 photo-diode light receiver that has produced a 14 dB improvement in performance over a single photo-diode. With this, Ken has copied Rex 5 days in a row via cloud bounce over a distance of 27 km with signals peaking -14 dB.

Joe Taylor K1JT has released a version of WSJT with experimental modes called JT2 and JT4. JT2 is a very narrow-band mode that uses two-tone frequency shift modulation to achieve sync and phase modulation to transfer information. Tests conducted between Rex VK7MO and Jim VK3II indicate that while JT2 does work on 2 metres, there are times when it fails with even good signal levels. Joe Taylor advises that the decoder is still very basic and improvements may be introduced.

JT4 uses 4-tone FSK and comes with versions JT4a to JT4g with different tone separations. The wider tone separations are designed to cope with libration frequency spreading with EME on the microwave bands and could also be useful for auroral scatter. Tests show that JT4a works very well on two metres but at this stage it does not include a Deep Search Decoder and its performance is limited to around -24 dB.

The prime motivation for JT2 and the narrower versions of JT4 is that with bandwidths of less than 10 or 20 Hz they permit a number of stations to operate within the same SSB pass band and thus could be useful for contesting. The wider tone-spacing versions of JT4 should be useful for 10 GHz EME. At this stage, however, neither mode is competitive with JT65. If you are interested in testing out these new experimental modes, Joe has a basic description and a status report on these experimental modes at:

http://physics.princeton.edu/pulsar/K1JT/JT2_JT4.TXT

and the program can be downloaded at:

http://physics.princeton.edu/pulsar/K1JT/WSJT598.EXE

Please send any Digital DX Modes reports to Rex VK7MO at rmoncur@bigpond.net.au.

The Magic Band – 6 m DX

Brian Cleland VK5BC

October has produced a few good sporadic E openings but no reported openings to JA etc.

Norm VK3DUT near Bairnsdale reports a good opening to VK4 on the 9th October working VK4s OE, BLK, ADM, ARN, WS, AHW & 2YDC/4 followed by ZL TV on the 10th October. Then on the 26th October Norm reported the VK5RBV beacon but no contacts and on the 30th October worked VK4ARS and VK5BC with more ZL TV on 2nd November along with the FK8 beacon and VK4 TV unusually late in the evening (1210 UTC).

Andrew VK4KAY at Mackay reports that 6 m has been poor:

"I have been in a 6 m drought, believe it or not. I have been out in my ute numerous times to see if I can get some openings away from the QTH. My QTH is about 5 km inland from the coast, so I have been driving to the beach to see if things are any better. Lots more F2 below 6 m but no E or F2 on 6 m".

Kevin VK4BKP from the same area reports working VK4TWR, JOO & BLK on tropo on the 4th October. On the 7th October Kevin worked Brian VK5BC, on the 8th worked several VK3's and VK1DJA and then on the 9th worked VK2s ZQ, BX, BHO & Rob VK1ZQR. On the 25th October Kevin worked Keith VK5AKM and Rob VK3XQ.

Brian VK5BC reports good openings

Continued next page

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•YAESU FT-1550 2 m. FM mobile, with manual, microphone,mobile mount, etc. 50 watt output. The whole case is diecast aluminium, ensuring very good heat sinking. Used only twice and in mint conditions $300.00. YAESU FC-20. HF/50 MHz Automatic Antenna Tuner. Two independent antenna output sockets. Mint condition, used once. IHas manual and cables. Suits FT-847 and FT-100. $350.00. Mirel VK2BOD 02 4333 1823

•KENWOOD TS-870 transceiver.Excellent condition, fully operational, no modes, comes with hand mike and power cable.Price $1700 plus postage. AUTEK RESEARCH VA1 antenna analyst $230 plus postage. Tom, VK2OE, 3 Buller St Bonalbo NSW 2469 wojiech.tomczyk@education.nsw.gov.au (preferred contact)

•***Free to a good home***: AMPEX 1 inch VTR Model VR7003. Sn 5104088. Early 1970s. It is in working condition. Located in Wagga Wagga NSW. Current owner doesn't want to see it go to the tip. You need to pick up. Contact John VK2YW on 02 6926 5471 AH.

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WANTED NSW

•ARC5 Receiver, 3-6MHz, BC-454-B complete, doesn't have to be working, orunder chassis parts T1, L15, C16. Required for rebuild, refurbishment projects. Richard L21211 QTHR 02 4998 1354 or email arjay1@aapt.net.au

WANTED VIC

•For Wireless Set No 11 Project No 2: an outer case for the unit, a receive aerial coil, (L1A, L1A'), a two pin plug for the PSU, a set of valve shields (8), a keying relay and a nameplate. Any chassis remnants for parts. Clem Jarvis VK3CYD, PO Box 285 Newborough 3825.

FOR SALE QLD

•**Silent Key estate: Alan Percival West VK4DWK**. Best offer the entire collection: YAESU FT-1000MP elite 200 W with power supply, still under warranty, DIAMOND CP6 multi-band vertical antenna (3.5/7/14/21/29/50 MHz, 5 kg), headphones, YAESU SP8 speaker, with accessories Earth stake copper clad steel, and cables. Set is complete. Purchased June 2005 hardly been used. (Paid just under $6000.00 just for transceiver, power supply, speakers, stake, & antenna, alone). YAESU FT-2800m VHF transceiver with 15 V 25A reg power supply, plus antenna, and accessories. Set is complete brought 14/06/2005 hardly been used. Paid $638.00 just for transceiver and power supply on its own. Solar mains regulator. MANSON SPS9 250 regulated power supply. SWAN350. REALISTIC AX-190 communications receiver. 3 x YAESU FT-101B & FV-101 transceivers & power supplies (1 only good for spares). DICK SMITH 75mm oscilloscope cat. Q-1286. 2 OSKERBLOCK Power/SWR meters. 2 x 2 metre antennas. 2 D/loads meters. 16 boxes of ass. cable, joiners, meters, valves, etc. Elizabeth dizzy-lizzys-dragonfiles@aapt.net.au or on 0408 476 749, north side of Brisbane.

WANTED QLD

•Grid dip oscillator; any make or model must work. Address QTHR. Email vk4krdav@bigpond.com

FOR SALE SA

•HILLS tower 8 m section 250 mm triangular lattice construction well galvan. with swivel base and winch, suitable for tiltover, $145. John VK5ARL QTHR 08 8395 9848

•VK5JST Antenna Analyser kits. (see AR article May 2006) Get your nearest and dearest a great Christmas present, or just treat yourself. Will keep you occupied over the holiday period. A world class unit at a fraction of the cost. For more details see www.scarc.org.au; contact SCARC PO Box 333 Morphett Vale SA 5162, or email: kits@scarc.org.au

WANTED SA

I am looking for an Icom UT-84 tone encoder. If you have one for sale, please contact me on mobile 0403-285-940 or via email vk5jaz@hotmail.com. Hank VK5JAZ

FOR SALE TAS

•Used coax conn: Andrew cable plug(m) L44J*3; bulkhead socket(f) UG496/U; bulkhead through conn.f/f,UG1019/U; right angle adaptor,m/f, pasternack PE9205. Offers, Bob VK7ZRF QTHR, 03 6376 3477.

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The Magic Band – 6 m DX - continued

and contacts as follows:-

4th October - Ray VK4BLK

7th October - Kevin VK4BKP, Andrew VK4KAY, Ray VK4BLK, Frank VK4FLR & Gary VK4ABW

9th October - Neville VK2YO, John VK2BHO & Colin VK2BCC

25th October- Kerry VK2BXT, Mike VK2XQ, John VK2BHO, Gary VK2DJ, Ted VK2ARA, Brian VK2AH, Mike VK2BZE & Gerry VK2APG/m (this was from Brian's portable QTH, Corny Point PF85mc and lasted several hours)

30th October- VK2s BZE, BXT, DJ, BHO, AH, Doug VK9ZLH (Lord Howe Is) and Norm VK3DUT.

Two stations of interest to look out for this coming summer season: Doug VK9ZLH on Lord Howe Island has a 4-element Yagi and has already worked Trevor VK3VG & Brian VK5BC on the 30th October.

The other station is Paul A35RK from Lifuka Island, OC-169 Grid Locator AH20te (part of the Tonga group of Islands). Paul has a 4-element Yagi and runs 100 W and is actively looking for VK/ZL contacts.

In last month's notes, I failed to mention the 52.100 MHz call channel. Standard licensees only have access to 52-54MHz and this is the call frequency listed in the WIA band plan for this portion of the band. I would suggest we should all monitor/scan this frequency as well as those in the lower portion of the band. I will add that 52.050 MHz is often used as the call frequency as well, particularly from ZL.

By the time this magazine is available, we should be well in the swing of our summer sporadic E season and hopefully this develops into a season as good as last year in December/January.

Please send any 6 m information to Brian VK5BC at bcleland@picknowl.com.au

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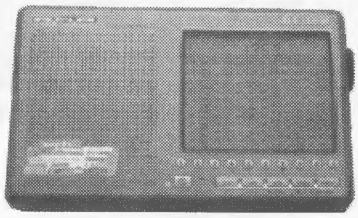

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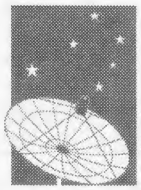

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VK1	VK1WIA:	Sunday 1100 local, on 7.128, 146.950 and 438.050 MHz. Email newsletter, on request, via president@vk1.ampr.org
VK2	VK2WI:	Sunday 1000 and 1930 local, on 1.845, 3.595, 7.146, 10.125, 14.170, 28.320, 52.525, 145.600, 147.000, 438.525 and 1273.500 MHz. Plus regional relays on 5.425 MHz USB (morning). VK1WIA news is included in the morning.
VK3	VK1WIA:	Sunday 1030 and 2000 local, on 3.615, 7.085, 10.130, 146.700, 147.250 and 438.075 MHz.
VK4	VK1WIA:	Sunday 0900 local via HF and major VHF/UHF repeaters.
VK5	VK5WI:	Sunday 0900 local, on 1.843, 3.550, 7.140, 28.470, 53.100 AM, 146.900 (SE), 146.925 (CN), 147.000 and 439.975
VK6	VK6WIA:	Sunday 0930 local, on 1.865, 3.564, 7.075, 10.125, 14.116, 14.175, 21.185, 29.120, 50.150, 146.700 and 438.525 MHz. Country relays on 3.582 MHz and major repeaters. Repeated Sunday, 1900 local, on 1.865, 3.564, 146.700 and 438.525 MHz. Country relays on major repeaters. Also in 'Realaudio' format from the VK6WIA website.
VK7	VK7WIA:	Sunday 0900 local, on 1.840 AM and 3.570 MHz and on major repeaters. VK7 regional news follows at 0930 local, on 7.090 and 14.130 MHZ, and on major repeaters.
VK8		Sunday 0900 local, on 3.555, 7.050, 10.130 and 146.900 MHz.

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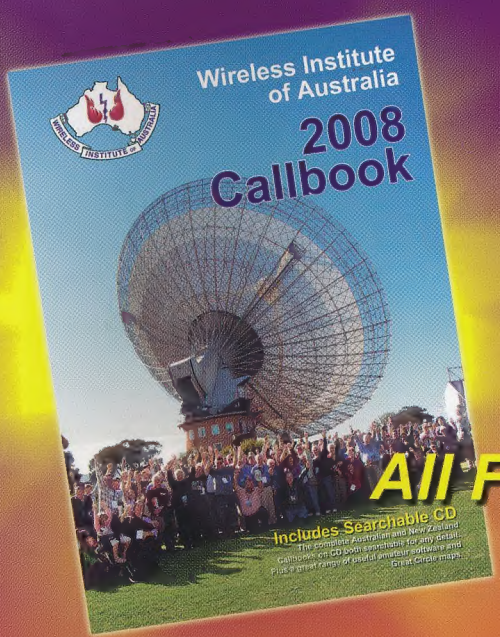

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